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ABSTRACT

The educational benefits for children served in day care programs funded from Title IV-A, Title XX, and the Social Services Block Grant (SSBG) through a contractual agreement with the Georgia Department of Human Resources, Division of Family and Children Services, Day Care Unit were examined. The study used a follow-back strategy to conduct a comparative analysis of school and nonschool achievement variables for students in three groups: those in the Atlanta Public Schools Title IV-A/XX/SSBG day care program, those in non-Atlanta Public Schools day care programs, and those who had no day care or less than 6 months of day care before entering kindergarten in the Atlanta Public Schools. The indices of school achievement were the total reading and total mathematics content areas of the California Achievement Tests. School achievement was measured for the school years 1980-81 to 1984-85 and for the kindergarten classes in 1985-86 and 1986-87. Other variables included preassessment at kindergarten entry, patterns of promotion and retention, selection for compensatory education, placement in the program for exceptional children, trends of mobility and stability in school attendance, socioeconomic indices associated with school transfers and withdrawals, and the schools' holding power from kindergarten to graduation. Significant differences between day care and no day care groups were found. Similar results were obtained in an analysis of reading and mathematics achievement for students in 22 of the 23 Atlanta Public Schools that operate Title IV-A/XX/SSBG programs. (RH)

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THE EDUCATIONAL BENEFITS OF DAY CARE

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DAY CARE UNIT

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THE EDUCATIONAL BENEFITS OF THE TITLE IV-A/XX/SSBG DAY CARE PROGRAM FOR STUDENTS IN THE ATLANTA PUBLIC SCHOOLS

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Report No. 3, Vol. 22, 1/88

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OVERVIEW

The prevailing issues related to the care and welfare of young children are meshed with the concerns of educators for providing quality basic education to students. Great emphasis has been focused on how early childhood education programs may improve future academic achievement and have a lasting impact on the lives of the program participants.

Research has shown that formal preschool intervention programs share a common effect, despite the wide diversity in intervention sites, age at intervention, length of intervention, and curricula models (Goldring and Presbrey, 1984; Castro, et al., 1983). Some of the sources for documentation of the value of early intervention in terms of the relationship of teacher approaches to child outcomes, immediate benefits to children, and benefit-cost effectiveness are Head Start (1969), Follow Through Program (1969 and 1976), and longitudinal studies of preschool intervention programs (Perry Preschool Project, 1984, and the Syracuse University Research Program, 1987).

With the recognition that early intervention provided the child development experiences which some children may not be otherwise afforded, the Atlanta Public Schools began a prekindergarten program for four-year-olds in 1966. The commitment to early childhood education continued through the provision of programs and services which included summer Head Start, Title I prekindergarten (Title I of the Elementary and Secondary Education Act), home economics laboratories for occupational child development, Title IV-A and Title XX comprehensive child day care (1967 and 1974 amendments to the Social Security Act), the Social Services Block Grant (SSBG), and other programs and services for early childhood intervention.

The goal of the early childhood education programs was to provide intervention to the population of young children who were the potential students of the Atlanta Public Schools. Each year the kindergarten class was comprised of approximately 850 children (17 percent) who attended the Atlanta Public Schools day care program for an average of 18 months.

Within the context of the impact of preschool experience on school achievement which was documented from a myriad of program evaluations and from research literature, it was important that local research efforts examine the educational benefits for children served in day care programs funded from Title IV-A, Title XX, and Social Services Block Grant and through contractual agreement with the Georgia Department of Human Resources, Division of Family and Children Services, Day Care Unit.

The research study addressed the research priorities established by the funding agency (Georgia Department of Human Resources, Division of Family and Children Services, Day Care Unit) and was designed to contribute to the planning needs of local educators, add to the crucial body of educational research on factors affecting the school achievement of children, and disseminate findings applicable for program development and policy formulation at local, state, and national levels.

The study employed a follow-back strategy for a comparative analysis of the school achievement and non-school achievement variables for students in three groups: Atlanta Public Schools Title IV-A/XX/SSBG day care program, non-Atlanta Public Schools day care programs, and students who had no day care or less than six months of formal day care prior to entering kindergarten in the Atlanta Public Schools.

Three independent samples were selected from the student records and data files: approximately 4,759 students in the kindergarten class of 1980-81, 32,080 in six kindergarten classes from 1981-82 to 1986-87, and 1,439 former Atlanta Public Schools day care participants who entered kindergarten from 1972-73 to 1979-80. The original samples consisted of approximately 7,572 students from the Atlanta Public Schools day care program, 14,918 from the non-Atlanta Public Schools day care program, and 15, 788 students who had no or less than six months of day care

The measure of school achievement was the California Achievement Tests, which was a norm-referenced standardized test administered annually in the spring to students in kindergarten through twelfth grade. The indicies of achievement were the normal curve equivalent (NCE) scores for the Total Reading and Total Mathematics content areas on the California Achievement Tests. School achievement was measured for the school years 1980-81 to 1984-85 and for the kindergarten classes in 1985-86 and 1986-87.

The examination of variables not fully dependent upon achievement test scores included preassessment at kindergarten entry, patterns of promotion and retention, selection for compensatory education, placement in the Program for Exceptional Children, trends of mobility and stability in school attendance, socio-economic indicies associated with school transfers and withdrawals, and the schools' holding power from kindergarten to graduation.

The findings delineated significant differences between the day care groups and the no-day-care group on study variables. The differences between the two day care groups (Atlanta Public Schools and non-Atlanta Public Schools were not as clearly identifiable, as the data for the two groups were quite comparable. The impact of day care was most noticeable for the Atlanta Public Schools day care students at kindergarten. The reading and mathematics scores for the Atlanta Public Schools day care group were very similar to the average for grade-level students.

For first grade, the mean reading and mathematics achievement for the Atlanta Public Schools day care students was lower than the level for the non-Atlanta Public Schools day care group and was not significantly different from the mean achievement for students in the no-day-care group. For second and third grades, the reading achievement for the Atlanta Public Schools day care group improved and was significantly higher than the mean achievement level for the no-day-care students. Day care and no-day-care students had higher achievement for mathematics than reading. The difference in mean mathematics achievement among the three groups was significant only for the non-Atlanta Public Schools day care students in comparison to the no-day-care group..

Students in each of the day care groups evidenced the greater need for compensatory education at first and second grade and a larger percentage of the no-day-care students remained in the program for more than two years. Atlanta Public Schools day care students needed compensatory education services again at grade 6 which was a transition grade from elementary to middle school. The Atlanta Public Schools day care students had kindergarten preassessment scores comparable to the level for non-Atlanta Public Schools day care students. The rate of grade promotion was higher than the no-day-care group and second to the rate for non-Atlanta Public Schools day care students. A greater proportion of the Atlanta Public Schools day care students remained enrolled in the school system over a seven-year period, but tended to change schools more than students in the comparison groups. Atlanta Public Schools day care students left their day care school-communities and transferred to schools throughout the school system. The reasons for withdrawal from high school prior to graduation were similar to the reasons indicated for other students in the system. Atlanta Public Schools day care students were identified in the high school graduation classes of 1984-85, 1985-86 and 1986-87.

Supplemental Report

The supplemental report provided an analysis of reading and mathematics achievement by day care experience, for students in 22 of the current 23 Atlanta Public Schools that operate Title IV-A/XX/SSBG programs.

The results were similar to that provided in the main report for students in the system. Mathematics achievement, generally, was higher than that for reading. The reading achievement differences were in favor of students with day care experience when compared to students who did not have day care experience. The levels of achievement between Atlanta Public Schools day care students and the non-Atlanta Public Schools day care students were more comparable in the 22 schools with day care programs, when compared to that for schools throughout the system. One difference in results from that obtained in the main report for students in the system, was that students in the Atlanta Public Schools day care program generally scored equally as well, or significantly higher on achievement tests than students in the non-Atlanta Public Schools day care programs.

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INTRODUCTION

In recent years, great emphasis has been placed on how educational services of early childhood education programs may improve future academic achievement and have a lasting effect on the lives of participants. The national enrollment in early childhood education programs is increasing, and there are indications of a continuous need to focus on problems related to the various aspects of early childhood education: the program quality, the curriculum, and approaches required to best meet the needs of children with differences in their characteristics and environmental experiences.

The concern for educational accountability has focused on students' mastery of basic skills, and a back-to-basics movement is occurring in public education. One of the underlying concerns is that children are to be taught the basics of reading, writing, and mathematics. The objective receiving increased focus in public education is that at every level of educational achievement, a pupil will be able to demonstrate consistently that he or she possesses the skills necessary to advance to the next instructional level. The effort to improve the quality of education for children entails meaningful contributions from early childhood education and involves the formal learning setting of the school.

The prevailing issues related to the care and welfare of children are meshed with the concerns of educators for providing quality basic education to students. At the national, state and local levels, there is attention directed to statistics and research findings which poignantly highlight issues related to child care and welfare: working parents; neglected, abused, and unsupervised children; teenage pregnancy, the divorce rate, and the changing characteristics of the family. The nature and scope of day care are changing and nursery school enrollment nationally has increased from 1.1 million to 2.1 million children from 1970 to 1980.

Research Atlanta (1984) and the Georgia Division of Family and Children Services (1985) cited statistical trends that indicated the importance of child care. Women in the labor force increased by 72 percent in Georgia from 1970 to 1980, and women currently constitute more than 44 percent of the labor force. In both Georgia and metropolitan Atlanta, approximately 54 percent of mothers with children under age 6 work full time. In metropolitan Atlanta, families with children which were headed by the female parent increased by 109 percent between 1970 and 1980, while the number of husband and wife families with children increased by only 19 percent.

Of approximately 1,196 families currently served in the Atlanta Public Schools day care program, 1,100 listed the female parent as head of household, 13 indicated that the head of household was a male parent, and 83 families listed both the male and female parents as heads of household.

Atlanta Public Schools demonstrated an expansive commitment to early childhood education through the provision of kindergarten and preschool programs. Programs and services to preschool children included summer Head Start, Title I prekindergarten (Title I of the Elementary and Secondary Education Act), home economics laboratories for occupational child development, Title IV-A and Title XX comprehensive child day care (1967 and 1974 amendments to the Social Security Act), the Social Services Block Grant (SSBG), and other programs and services for early childhood intervention.

With the recognition that early intervention programs provided the child development experiences which some children may not otherwise be afforded, the Atlanta school system initiated a prekindergarten program for four-year-olds in 1966. By 1969-70, there were 19 prekindergarten programs. Another development which occurred in 1966 was the establishement of the Occupational Home Economics Child Development Laboratories for high school juniors and seniors. Summer Head Start programs operated from 1965 to 1970, and a special readiness program for preschool children and their parents was provided under Title I of the Elementary and Secondary Education Act.

Since the initial implementation of preschool programs, the objective has been to provide early intervention to the population of young children who were the potential students of Atlanta Public Schools. Data obtained over the past five years indicated that approximately 17 percent of the entering kindergarten class consisted of students who received services in the Atlanta Public Schools day care program prior to entering school. Throughout the operation of preschool programs in Atlanta Public Schools, program evaluations and comparative analysis of data for children with preschool and no preschool experience reaffirmed the importance of preschool experience for the child; and the immediate short-term impact of these programs was recognized.

Within the context of the impact of preschool experience on school achievement which was documented from a myriad of program evaluations and from research literature, it was important that local research efforts examine the educational benefits for children served in day care programs funded from Title IV-A, Title XX, and Social Services Block Grant and through contractual agreement with the Georgia Department of Human Resources, Division of Family and Children Services, Day Care Unit.

The research study addressed the research priorities established by the funding agency (Georgia Department of Human Resources, Division of Family and Children Services, Day Care Unit) and was designed to contribute to the planning needs of local educators, add to the crucial body of educational research on factors affecting the school achievement of children, and disseminate findings applicable for program development and policy formulation at local, state, and national levels.

REVIEW OF THE LITERATURE

Historical Context

The issues surrounding the questions of how children are to be cared for in the absence of their parents, or outside of the home, are recurrent concerns and have a long history dating back to the Elizabethan era of 1558.

Children in need of care were assigned to almshouses, orphanages, the extended family, and foster care homes. Day care had its beginning in the day nurseries of the early 1800s which cared for infants and children outside of the home for eight to ten hours a day. The development of child care and welfare programs in this country included the orphanages during the pre and early 1800s, and the development of programs and services continued through the nineteenth and twentieth centuries. The programs and services included day nursery, foster home care, kindergarten, Aid to Families With Dependent Children, nursery school, Works Progress Administration (WPA) nursery and day care and Lanham Day Care. The more contemporary programs include Head Start, Title IV-A Day Care and Title XX Day Care; and other private, parochial and public child care programs and services.

The contemporary federal and state fiscal involvement in child care is supported by several major sources of funds which are the the outgrowth of the passage of the Social Security Act of 1935, and the Economic Opportunity Act of 1967.

Theory and Conceptualization

The period of early childhood is generally defined as the age range of 2 to 6 years and is often referred to as the preschool years. The literature review contributed an overview of the major concepts and theories of development relative to the early childhood or preschool period, and it provided a synthesis of the pertinent facts and generalizations about child development in the physical, motor, cognitive and intellectual, language, social, and emotional domains. The literature review further suggested important issues and problems which must be addressed by policy makers and providers of child care and educational services.

Gesell (1940) contributed knowledge that developmental changes occurred as a result of the natural unfolding and maturity of physiological structures called ages and stages. Children moved from one stage to another at their own individual ages of readiness. Although Gesell proposed a sequence of stages as norms of behavioral development, he also recognized the impact of individual differences.

Current educational practices related to the concept of "readiness" are based upon the maturationist ideas of Gesell and others. The educational practices are based on the assumption that given a supportive teacher and a nurturant environment, the child will perform expected, age-related behaviors. The concept of readiness stressed social and emotional objectives for early childhood development programs and a de-emphasis of cognitive and intellectual objectives, since the maturationist theories suggested that children are not ready for academic tasks until a later stage.

Piaget (1950) contributed findings from an extensive study of the intellectual development of the child. Theories of Piaget and others which are derived from the organismic perspective used the concept of developmental stages to refer to levels of internal organization of self-regulatory processes of cognitive and intellectual development. Piaget developed the theory of cognitive development which was a set of biological-based processes known as the stage-independent and stage-dependent components.

Current educational practices derived from the cognitive developmental theory are based upon the assumptions that the child progress through a sequential series of stages of mental development, and that provisions must be made for active participation by the child in constructing and organizing his experiences.

Researchers such as Bloom (1964) and Skinner (1953) suggested that the environment plays a major role in shaping the growth and development of the child. Environment was understood to provide the structure for behavior so that the child becomes a product of the special stimulus situations and the reinforcing elements of a particular environment. The stimulus-response learning theory of child development suggested that environmental manipulation during the preschool years impacted on the child's later growth and development.

Current educational practices from the mechanistic, environmental tradition follow a structured pedagogy, and use teaching strategies that are validated by learning principles. Program planners decide what children are to learn and structure carefully sequenced tasks with appropriate teaching materials and procedures. The primary means for effecting change in the child's growth and development is environmental manipulation.

Although each theory of child development formulated different principles, planner of child development programs must keep in mind that no aspect of early childhood development proceeded independently of all others. Tanner (1970) and DeVries (1974) explained that functional interrelations between aspects of development are important for structuring the child development program and services. The rate of a child's physical growth was important for intellectual development and socio-emotional well-being. In turn, intellectual and socio-emotional well-being influenced how the child interacted with the environment for physical development.

The literature reinforced the concept that there are certain fundamental aspects of development which should be incorporated into early childhood programs. These aspects of child development are the physical-motor-sensory, cognitive-intellectual, language, social-play, emotional and self-concept.

The body of contemporary research provides a linkage between developmental theories and program practices and supports the notion that a child's development may employ different approaches. The child's performance is documented in accordance with the teaching approach and curriculum model used.

Related Research Findings

Some of the sources for documentation of the value of early intervention in terms of the relationship of teacher approaches to child outcomes, immediate benefits to children, and benefit-cost effectiveness are Head Start (1969), Follow Through Program (1967) and longitudinal studies of day care programs (Perry Preschool Project, 1984, and the Syracuse University Research Program, 1987). A common thread throughout the varying contemporary programs is the inclusion of an emphasis on early childhood development as a means of encouraging socialization and emotional development of young children, early childhood education as a means of providing cognitive and academic education and the continuity of learning during subsequent schooling.

One of the first major evaluations of the Head Start Program by Westinghouse Learning Corporation and Ohio University (1969) concluded that the program, while effective for full-year preschool students, was not effective for students who participated only during the summer months. Data reported from the Office of Economic Opportunity in 1970 indicated that there were great variations in the annual child care cost for custodial, educational and developmental child care. This raised the issue of whether annual child care cost may be reflective of the program quality and the subsequent benefits derived from the child care program.

The longitudinal evaluation of the Follow Through Program conducted by Stanford Research Institute (Stebbins, et al., 1976 and 1977) and subsequent research efforts (House, et al., 1978) stated that the Follow Through experience indicated that educational problem solving and educational change must be conducted primarily at the local level, and that no educational model or approach can work everywhere. The Follow Through evaluation showed greater variability in effectiveness among sites implementing the same model (within-model variance) than there was between the educational models (between-model variance). Thus, the program models were adapted to meet the local educational needs.

Weikert (1967) described the Perry Preschool Project as a school-and home-based preschool program instituted in the Ypsilanti (Michigan) Public Schools in 1962. The program was designed to serve culturally deprived, functionally retarded three-and four-year-old black children for the purposes of providing research opportunities and enabling the children to succeed in school.

A longitudinal study of the Perry Preschool Project conducted by the High/Scope Educational Foundation in 1984 reported data at several grade-level progressions and when the participants were age 19. The study concluded that the preschool intervention program had wide-ranging and lasting positive results for the participants through early adulthood and yielded long-term benefits to society in cost savings when compared to the control group (Berrueta-Clement, 1984).

The Perry Preschool Project included 123 Black children ages three and four years old, with parents of low educational attainment (80 percent of mothers were not high school graduates), and low socioeconomic status (47 percent were single-parent families, 50 percent were welfare recipients). The I.Q. scores of the children ranged from 61 to 88 on the Stanford-Binet Intelligence Test. The study group of participants were assigned to the experimental group (58 children) that received preschool services and the control group (65 children) that did not receive program services. The size of the experimental group consisted of 13 four-year-olds and 8 three-year-olds in 1962, 12 three-year-olds in 1963, 13 three-year-olds in 1964 and 12 three-year-olds in 1965. The teacher-child ratio averaged 1:5 and the teachers were trained in both special education and early childhood education. The program operated from October to May and consisted of three service components: a center-based, cognitive-oriented program for 2 1/2 hours each morning for 5 days per week; a 1 1/2-hour home visitation to each child's home by the teacher once a week; and semimonthly group meetings of parents. The estimated average cost per participant (operating and capital) was $4,963 for one year and $9,708 for two years (Barnett, 1985).

The widely disseminated results of the Perry Preschool Project longitudinal study indicated that when compared to the control group from similar family backgrounds, a significantly lower percentage of program participants at age 19 were high school dropouts, welfare recipients or had been arrested for delinquent offenses. A significantly higher percentage of program participants at age 19 were employed, self-supporting, and pursuing postsecondary education or job training when compared to the control group. Of the students in the experimental group, 15 percent were at one time classified as mentally retarded and spent 16 percent of their school years in special education. The control group had 35 percent at one time classified as mentally retarded and students spent 28 percent of their school years in special education.

Barnett (1985) concluded in his benefit-cost analysis of the Perry Preschool Project that the program was a good investment for society at the cost of one program year. That is, for every one dollar spent on the program participants when they were 3 or 4 years old, the later economic benefits were six dollars in reduced costs of special education services, delinquent offenses, welfare assistance, and benefits derived from improved educational attainment and labor market participation. Barnett concluded that there was relatively strong evidence that the program was also a good investment at the cost of two years of program services.

The Syracuse University Follow-up Study of the Family Development Research Program (Lally, Mangione and Honig, 1987) resulted in findings which were different from those reported by the Perry Preschool Project. A 10-year follow-up study of participants in an early intervention program for low-income children and their families in the Syracuse Public Schools reported that while the children benefited from the program during the first five years, the benefits were not lasting through subsequent years. The researchers concluded that an early intervention program which offered no continuing family support services produced few long-lasting benefits for low-income children.

The Syracuse University study was of 156 low-income children, with 82 children chosen to participate in the Syracuse prekindergarten program and 74 children who attended other child care programs or remained at home. Ten years following the 1969 prekindergarten program, 60 percent of the total study sample were retained in a grade at least once. For the experimental group, 70 percent of the children were retained in a grade or placed in a special education class as compared to 69 percent for the control group. The study further showed that none of the program girls were failing in seventh and eighth grade and that program girls surpassed program boys and control group participants in social aspects such as positive attitudes, self-image and self-control. Similar to a finding in the Perry Preschool Project, the Syracuse University study concluded that teenagers who attended the prekindergarten program incurred less court costs for detention and probation than participants in the control group.

One of the policy implications of the Syracuse University study was that ongoing assistance through transition programs was needed once the participants left the prekindergarten program to avoid an abrupt termination of intervention.

The National Survey of Schools (Coleman Report, 1964) indicated that unequal achievement among public school students could not be ascribed only to unequal school resources and that there were other factors which influenced the achievement of disadvantaged and minority students. Much educational research has concentrated on the achievement of disadvantaged and minority public school students, with emphasis on the home, preschool experience, classroom environment, teacher characteristics, school administration and policy issues.

The heightened interest in preschool education and the disagreement over its effectiveness have generated a need for information on what education is currently being provided to preschoolers, what outcomes should be expected, and how preprimary programs complement learning in the home (Plisko, et al., 1986).

Only a small number of national surveys collected representative data relevant to the policy issues and concerns about preprimary or preschool education. The responsibility for government-sponsored surveys included the U. S. Department of Education and other federal agencies. In the U. S. Department of Education, information about preschool participation was collected by the Common Core of Data (CCD) on public school systems, the High School and Beyond (HSB) longitudinal study of the National Center for Educational Statistics, and the National Assessment of Educational Progress (NAEP) under the National Institute of Education. Other federal services which collected information about preprimary education included the Current Population Survey (CPS), the Head Start Annual Survey under the Department of Health and Human Services, and the National Day Care Study of 1976-77.

Much of the contribution to the educational research literature on preschool education emanated from group collaborations (research centers, foundations, universities) and individual program evaluations and research studies. From a synthesis of research literature and a meta-analysis of existing research studies, the Educational Research Services and Castro, et al. (1983) concluded that in most of the research studies reported, a variety of prekindergarten or preschool programs have significant and substantive short-term effects on disadvantaged and minority children as measured by I. Q. scores and achievement on standardized tests. There was little evidence to document either the long-term effectiveness of the preschool programs reported or the effects of variations in program characteristics.

Goldring and Presbrey (1984) employed a meta-analytic approach to determine the effectiveness of preschool intervention programs across individual evaluation studies of eight preschool programs: the Philadelphia Project; Gainesville (Florida)

Parent Education Program; Long Island (New York) Mother-Child Program; Louisville (Kentucky) Experimental Head Start; Harlem Training Project; Ypsilanti (Michigan) Perry Preschool Project; Murfreesboro (Tennessee) Early Training Project; and the New Haven (Connecticut) Follow Through Study. The results of the analysis indicated that despite the diversities in intervention sites, ages of children at intervention, length of intervention, and curriculum models, the eight preschool intervention programs reported had a homogeneous positive effect on I. Q. scores and reading and mathematics achievement through the fifth grade; and influenced the attainment of educational requirements through the high school grade levels (lower percentage of underachievers, special education placement and school dropouts).

Generalizations drawn from the individual program evaluations and research studies on the effects of preschool intervention programs for socioeconomically disadvantaged and minority children were that preschool programs frequently did have short-term positive results and may also have long-term effects on the cognitive functioning and later school achievement of program participants.

The Huntsville-Madison County (Alabama) Education Improvement Program (Cecil, 1971) stressed in its longitudinal study that teacher personality factors, organizational skills, and teaching ability appeared to play the decisive role in the short-and long-term impact upon children's school performance. The Gainesville, Florida follow up study (Van De Riet and Van De Riet, 1969) of 72 Black children from kindergarten through third grade concluded that the developmental level of the preschool group remained higher than the no-preschool group but the difference between the groups decreased to the extent of being statistically non-significant by the end of the third grade year. Barnes, Watts, et al. (1981) and Popwell (1985) found that the impact of day care was noticeable at the end of kindergarten and first grade for some performance indicators. Beyond first grade and for the groups of students retained one or more times, yearly achievement gains between the day care and no-day care groups were less identifiable by day care experience. The longitudinal data collected by the Chicago EARLY Program (Naron, 1981) indicated that for four-year-old prekindergarten students who were considered likely to have later learning problems, the preschool gains were maintained through second grade and their achievement was generally more satisfactory than that of the control group which had no prekindergarten experience.

In the Appalachian region of Kentucky (Archambo, 1970), the greatest loss in intellectual functioning for former child care project children occurred in the first grade for students with I. Q. scores of above 80 and who were retained in the first grade. It was indicated that project mothers were equal to or more effective than project teachers in teaching children to perform structured tasks.

Students varying in their readiness to profit from instruction are said to differ in aptitude. Academic growth is affected not only by cognitive ability but relevant prior instruction, motivation, and specific interactions of learning considerations with features of the curriculum and instruction (Cronbach and Snow, 1977). Differential achievement is also to be expected because students enjoy varying levels of out-of-school support for learning. Not only may parental support and expectations influence student motivation and effort, but some parents may share directly in the tasks of instruction (Hinkley, Beal, et al., 1979). Parents are their children's first and most influential teachers. What parents do to help their children grow, develop and learn is important to children's success in school.

Educational and social research findings may not bring simplicity to complex issues, and often there are rival interpretations of research findings. For many educational issues, research findings are consistent and fairly stable over time.

THE COMPREHENSIVE CHILD DAY CARE PROGRAM

The Atlanta Public Schools Comprehensive Child Day Care Program began on March 1, 1971, with funding from the Title IV-A Social Services provisions of the 1962 and 1967 amendments to the Social Security Act. The services were for strengthening family life and fostering child development. The guidelines stated that:

> Services may be provided to meet the needs of a child for personal care, protection , and supervision, but only in the case of a child where the provision of such services is needed in order to enable a member of such child's family to accept or continue in employment or to participate in training to prepare such member for employment, or because of the death, continued absence from the home, or incapacity of the child's mother and the inability of any member of such child's family to provide adequate care and supervision for such child.

Day care services under Title IV-A were made available to children of families in the following eligibility categories:

1. Current recipients of Aid to Families with Dependent Children for which the need for day care was stated in the individual service plan;

2. Former recipients to Aid to Families with Dependent Children within a specified number of months (i.e. three to six months); and

3. Potential recipients of or applicants for financial assistance within a specified period of time (e. g. one year).

The social services goals were to enable families to achieve self-support and self-care and to prevent or reduce dependency.

Six school centers, one middle and five feeder elementary schools, were developed in a geographical area of northwest Atlanta in which a large number of families resided who were potentially eligible for services.

The program operated from 10 to 11 hours on weekdays and included three components: the day care program for infants, toddlers and prekindergarten children through age 4; the expanded-day program for five-year-olds who attended the Atlanta Public Schools half-day kindergarten program, and the extended-day program for the school-age children ages 6 through 12. The service components included early childhood education, parental involvement and advisory, nutrition, health, social services, staff training, curriculum development, and program monitoring and evaluation.

The Atlanta Public Schools comprehensive child day care program operated under the guidelines and social services provisions of Title IV-A from 1971 to 1975. The number of centers increased from 6 to 38, and program participants increased from 1,165 to 3,755. The program cost (cash) was approximately $1,041,000 for six centers in 1971 and averaged approximately $3,372,600 for each twelve-month program year from 1972 to 1975.

On January 4, 1975, President Gerald Ford signed into law the social services amendments of 1974 (Public Law 93-647). The 1974 amendment became effective October 1, 1975, and replaced theTitle VI-A social services provisions with Title XX Grants to States for Services.

Under Title XX, a primary client was considered to be an individual with whom or for whom a specific goal had been established and who received social services for the purpose of achieving that goal. The national service goals for day care were:

1. Achieving or maintaining economic self-support to prevent, reduce or eliminate dependency;

2. Achieving or maintaining self-sufficiency; and

3. Preventing or remedying neglect, abuse or exploitation of children and adults unable to protect their own interests; or preserving, rehabilitating or reuniting families.

Day care services under Title XX were made available to individuals in four eligibility categories. Income maintenance clients were recipients of Aid to Families with Dependent Children, and recipients of Supplemental Security Income

(SSI Aged, Blind, Disabled). Income-eligible clients were determined according to family monthly gross income from Medical Assistance, County General Assistance, and included nonrecipients who fell within a predetermined income range. Clients who were eligible without regard to income were referrals from the Department of Family and Children Services for children under Protective Services. Provisions for fee-paying clients were instituted in January, 1977, to allow former Title XX recipients to pay for services once they exceeded the income-eligible scale. Eligibility under Title XX was related to employment, job training, seeking employment, or referrals from the Department of Family and Children Services.

During the remainder of the 1970s, 35 day care centers were in operation, but the number of children served was reduced as program guidelines redefined eligibility and the client population. The extended-day programs for school-age children were discontinued and other planning decisions included the eventual elimination of services to infants. By 1984 under the Social Services Block Grant funding, the comprehensive child day care program operated in 26 schools and served 1,450 preschoolers ages three through five. In 1986-87, day care programs operated at 23 school centers, served 1,290 children ages three through five on weekdays for an eleven-month program year, and had an annual program cost (cash) of approximately $2,321 per child (Table 1).

The broad program goals maintained throughout the operation of the comprehensive child care program were to provide for the social, emotional, physical, and cognitive growth of children; and to assist families with sustaining self-sufficiency, financial self-support, and family life.

Prior to 1979-80, the day care program was staffed with certificated early childhood education teachers and social workers. Since that time, a staff of paraprofessionals, under the supervision of the school principal, provided the service components of early childhood development, nutrition, health, parental involvement and social services. A program coordinator assumed the liaison relationship with the administrative, resource, instructional and support staffs. The program coordinator also facilitated planning, implementation, training, monitoring, fiscal management and compliance with state and federal guidelines. Two resource teachers assumed a more direct relationship with program implementation and service delivery at the day care centers. The advisory councils allowed consumers, providers and community representatives the opportunity for planning and other advisory functions.

TABLE 1

THE ATLANTA PUBLIC SCHOOLS TITLE IV-A/XX/SSBG DAY CARE PROGRAM

1971-72 TO 1986-87

PROGRAM YEAR	NO. OF CENTERS	NO. OF ALLOCATED SLOTS	CHILD CARE PROGRAM		
			DAY CARE	EXPANDED DAY	EXTENDED DAY
1971-72	6	1,165	X	X	X
1972-73	31	3,092	X	X	X
1973-74	39	3,755	X	X	X
1974-75	38	3,755	X	X	X
1975-76	36	3,729	X	X	X
1976-77	35	3,555	X	X	X
1977-78	35	2,347	X	X	
1978-79	35	2,006	X	X	
1979-80	33	1,929	X	X	
1980-81	31	1,500	X	X	
1981-82	30	1,450	X	X	
1982-83	26	1,450	X	X	
1983-84	26	1,290	X		
1984-85	23	1,290	X		
1985-86	23	1,290	X		
1986-87	23	1,290	X		

THE RESEARCH PROJECT

The research project investigated the immediate and sustained effects of day care experience on school achievement, and measured the association of day care experience with other non-school-achievement outcomes for students in the Atlanta Public Schools. The research project was conducted through contractual sponsorship from the Division of Family and Children Services, Day Care Unit, of the Georgia Department of Human Resources. Responsibilities for principal investigation and project management were designated to the Division of Curriculum and Research Services, Department of Research and Evaluation, of the Atlanta Public Schools.

The research priority established by the sponsoring agency was to determine educational benefits for children who received services in the Title IV-A/XX/SSBG day care program in the Atlanta Public Schools. The study aimed to analyze measures of achievement and other school-related outcomes for children served in the day care program for a longitudinal period including, but not limited to, 1980 to 1985 and made comparisons with groups who did not receive services in the Atlanta Public Schools Title IV-A/XX/SSBG day care program.

The research project examined, in a cross-sectional method from past program years, school achievement and non-school-achievement outcomes for the Title IV-A/XX/SSBG day care students in the Atlanta Public Schools. The treatment measured was day care experience which already had occurred. Therefore, a "follow-back" strategy was used to determine the antecedent conditions, student characteristics, and program variables which influenced the educational benefits and outcomes measured. The research design was quasi-experimental in that the researcher did not have pre-experiment control of the random assignment of subjects to treatment, control or comparison groups; or manipulation of the application of treatment.

The researcher identified three groups of Atlanta Public Schools students that were different based on the day care experience prior to entering kindergarten. The Atlanta Public Schools day care group consisted of students who received services in the Atlanta Public Schools Title IV-A/XX/SSBG comprehensive child day care program. The two comparison groups consisted of students who attended non-Atlanta Public Schools day care programs, and students who did not receive significant preschool experience in a formal setting prior to entering kindergarten.

The characteristics and behaviors of the sample group on variables associated with achievement and other school-related outcomes were analyzed to determine group differences, similarities, correlational relationships, and the association of variables with outcomes.

The research method consisted of a systematic content analysis of existing data sources. The primary sources of data were precompiled records and data from the day care program and the Atlanta Public Schools student data files. The original sample was selected from the records and student data files and consisted of approximately 7,572 students from the Atlanta Public Schools day care program, 14,918 from non-Atlanta Public Schools day care programs, and 15,788 students in the no-day-care group. Approximately 25 percent of the original sample created from data files was lost to the study because of missing data for the measures for achievement and other school-related outcomes and because of nonenrollment during the school years used in the analysis.

Students in the kindergarten class of 1980-81 were grouped by previous day care experience into three comparison groups: Atlanta Public Schools day care, non-Atlanta Public Schools day care, and no-day-care. Analysis of school achievement and other school-related outcomes was made for the students in each day care comparison group who attended the Atlanta Public Schools from 1980-81 to 1984-85. Data collection and analysis for this sample consisted of a five-year comparison for one kindergarten group (Table 2).

Students in the kindergarten classes from 1981-82 to 1986-87 were also grouped by previous day care experience into the three comparison groups. Analysis of school achievement and other school-related outcomes was made for the students in each comparison group who attended the Atlanta Public schools for their respective kindergarten years. Data collection and analysis for this sample consisted of a one-year comparison for six kindergarten groups (Table 2).

In addition to the five-year and one-year day care comparison groups, the study examined the achievement outcomes for a sample of former Atlanta Public Schools day care program participants who entered kindergarten in the Atlanta Public Schools from 1972-73 to 1979-80. The waves of grade-level students identified from 1972 to 1980 included high school graduates in the classes of 1984-85, 1985-86, and 1986-87.

Data collection and analysis for this sample consisted of a five-year achievement trend for a matched group of former Atlanta Public Schools day care participants who attended the Atlanta Public Schools from 1980-81 to 1984-85 (Table 3).

The research project was conducted in the Atlanta Public Schools during the period of February 15, 1987, to August 31, 1987. The senior personnel, management, and support staffs consisted of a research coordinator, statistician/programmer, research clerical assistant, data entry/statistical assistant, and a senior typist/word processor. The final report presents findings, conclusions, recommendations and emperical data for decision making.

The research findings have potential value for improving child care and educational opportunities for children, and will be of value in the effort to improve the quality of participation of parents and clients in program services. Toward this end, the research project has the potential for subsequent replication and a broader follow-up application to encompass those aspects of the day care program which were not targeted in this research project.

Two primary limitations of the study that warrant further refinement of the data are the constraints resulting from content analysis of historical data, and the lack of program descriptions for the variety of child care programs and services that were included in the non-Atlanta Public Schools day care group. Identification and description of other day care programs would allow for within-and between-group comparisons among community-based Title IV-A/XX/SSBG programs, similar federal or state subsidized day care programs; and the private, parochial, corporate and other non-subsidized child care programs and services.

TABLE 2

DAY CARE COMPARISON GROUPS
KINDERGARTEN 1980-81 THROUGH GRADE 4

Five -Year Comparison for One Group

Day Care Group	Number and Percent of Students 1980-81	
	N	Percent
Atlanta Public Schools (APS Day Care)	846	18
Non-Atlanta Public Schools (Non -APS Day Care)	1,949	41
No or Less than Six Months (No Day Care)	1,964	41
Total	4,759	100

DAY CARE COMPARISON GROUPS
KINDERGARTEN 1981-82 TO 1986-87

One-Year Comparison for Six Groups

Day Care Group	Number and Percent of Students											
	1981-82		1982-83		1983-84		1984-85		1985-86		1986-87	
	N	%	N	%	N	%	N	%	N	%	N	%
Atlanta Public Schools (APS Day Care)	899	19	845	18	873	17	872	16	921	15	877	15
Non-Atlanta Public Schools (Non-APS Day Care)	2,020	42	1,987	42	1,994	40	2,066	38	2,472	40	2,430	41
No or Less Than Six Months (No Day Care)	1,853	39	1,894	40	2,164	43	2,539	46	2,722	45	2,652	44
Total	4,772	100	4,726	100	5,031	100	5,477	100	6,115	100	5,959	100

TABLE 3
ATLANTA PUBLIC SCHOOLS STUDENTS
WHO ATTENDED THE ATLANTA PUBLIC SCHOOLS TITLE IV-A/XX/SSBG
DAY CARE PROGRAM FROM 1971-72 TO 1979-80

Matched Group, Five-Year Achievement Trend
1980-81 To 1984-85

WAVE 1		WAVE 2		WAVE 3		WAVE 4	
(N = 196)		(N = 226)		(N = 101)		(N = 466)	
Grade	Year	Grade	Year	Grade	Year	Grade	Year
Kdg. ----	1972-73	Kdg. ----	1973-74	Kdg. ----	1974-75	Kdg. ----	1975-76
1	74						
2	75	1	75				
3	76	2	76	1	76		
4	77	3	77	2	77	1	77
5	78	4	78	3	78	2	78
6	79	5	79	4	79	3	79
7	80	6	80	5	80	4	80
8	81	7	81	6	81	5	81
9	82	8	82	7	82	6	82
10	83	9	83	8	83	7	83
11	84	10	84	9	84	8	84
12	85	11	85	10	85	9	85
1 Yr.		12	86	11	86	10	86
Grad.	86	1 Yr.		12	87	11	87
2 Yr.		Grad.	87				
Grad.	87						

TABLE 3 (CONTINUED)

ATLANTA PUBLIC SCHOOLS STUDENTS
WHO ATTENDED THE ATLANTA PUBLIC SCHOOLS TITLE IV-A/XX/SSBG
DAY CARE PROGRAM FROM 1971-72 TO 1979-80

Matched Group, Five-Year Achievement Trend
1980-81 TO 1984-85

WAVE 5 (N = 85)		WAVE 6 (N = 88)		WAVE 7 (N = 87)		WAVE 8 (N = 190)	
Grade	**Year**	**Grade**	**Year**	**Grade**	**Year**	**Grade**	**Year**
Kdg. ----	1976-77	Kdg. ----	1977-78	Kdg. ----	1978-79	Kdg. ----	1979-80
1	78						
2	79	1	79				
3	80	2	80	1	80		
4	81	3	81	2	81	1	81
5	82	4	82	3	82	2	82
6	83	5	83	4	83	3	83
7	84	6	84	5	84	4	84
8	85	7	85	6	85	5	85
9	86	8	86	7	86	6	86
10	87	9	87	8	87	7	87

RESEARCH QUESTIONS

The research priority for the study was to ascertain facts and establish relationships among the variables stated in two research questions.

1. On specified measures of school achievement, how does the level of performance for students who received services in the Atlanta Public Schools Title IV-A/XX/SSBG comprehensive child day care program compare to the following comparison groups?

   a. Students who received services from child care programs other than the Atlanta Public Schools Title IV-A/XX/SSBG comprehensive child day care program. This comparison group is defined as students who received significant day care experience in non-Atlanta Public Schools day care programs.

   b. Students who did not receive day care services in the Atlanta Public Schools Title IV-A/XX/SSBG comprehensive child day care program or a comparable day care program. This comparison group is defined as students who had no significant day care experience prior to entering kindergarten.

   c. The mean level of performance for the total students comprising the norm or reference group. This comparison group is defined as total grade level or a specified subgroup in which students have membership.

2. To examine some variables not fully dependent upon achievement tests scores, the following questions were investigated:

   a. To what extent have students receiving Atlanta Public Schools day care services progressed through the various grade levels? That is, do students receiving day care tend to be on their scheduled grade level, and how does their frequency of grade retention compare to that of their peers in the comparison groups?

b. How does the frequency of selection for compensatory education programs such as Title I and Chapter I compare between students receiving Atlanta Public Schools day care services and the comparison groups?

c. How do school stability and mobility patterns compare between the students receiving Atlanta Public Schools day care services and the comparison groups?

d. How does the incidence of "school leavers" prior to graduation for the Atlanta Public Schools day care students compare to the norm or reference group?

FINDINGS

Several new thrusts occurred in the institutional setting of the Atlanta Public Schools in 1980-81. The full-day kindergarten program was implemented, the Pupil Progression Policy was adopted at grade 1, and the California Achievement Tests (CAT) was selected as a measure of student achievement in grades kindergarten through 12.

The California Achievement Tests was a norm-referenced, standardized achievement test which was administered to students annually in the spring, from 1980-81 to 1984-85. The test was designed to assess the achievement level of students in kindergarten through twelfth grade in six content areas: prereading, reading, spelling, language, mathematics and language skills.

The measure of achievement for the study consisted of the Total Reading and Total Mathematics content areas. The normal curve equivalent score (NCE) was used as an equal-interval scale to report student achievement. The mean was used as a measure of central tendency for the normal curve equivalent score. A mean NCE of 50 indicated achievement at the national norm.

To obtain a consistent measure of achievement for all groups in the study samples, the study used the mean normal curve equivalent score for Total Reading and Total Mathematics on the California Achievement Tests for school years 1980-81 to 1984-85, and for the kindergarten classes in 1985-86 and 1986-87.

The 1980-81 full-day kindergarten program was provided to eligible five-year olds the year preceding first grade. The program followed the hours of the regular elementary school day, the curriculum met the standards of the basic curriculum content for kindergarten programs in Georgia, and the teachers were certified under the same procedures as elementary and secondary teachers in the state of Georgia. The specified measures of achievement in kindergarten included the pre reading and mathematics performance on the California Achievement Tests. Given this baseline data, the achievement by day care experience was analyzed for a sample of 3,383 kindergarten students who remained in the Atlanta Public Schools for five consecutive years from 1980-81 to 1984-85.

Five-Year Achievement Comparison for One Kindergarten Group

The descriptive statistics for the sample of kindergarten students who attended Atlanta Public Schools for five consecutive years from 1980-81 to 1984-85 are presented in Table 4. For the total sample of 3,383 students, 610 (18 percent) received day care services in the Atlanta Public Schools Title IV-A/XX/SSBG program (APS). The comparison groups consisted of 1,355 (40 percent) from non-Atlanta Public Schools day care programs (non-APS) and 1,418 (42 percent) that entered kindergarten with no or less than six months of formal day care experience (no day care).

A description of the progression status of the sample showed that 72 percent of the students from the Atlanta Public Schools day care program were not retained during the five-year period. That is, 436 of the 610 Atlanta Public Schools day care students who entered kindergarten in 1980-81 were in grade 4 in 1984-85. For the comparison groups, a slightly higher percentage of non-Atlanta Public Schools day care students (77 percent) were not retained during the five-year period, and the lowest rate of promotion (62 percent) occurred for the no-day-care group.

A closer examination of student grade retention showed that 805 of 3,383 students (24 percent) in the total sample were retained one time and 163 (5 percent) were retained more than one time. Specifically, 805 students who entered kindergarten in 1980-81 were in grade 3 in 1984-85, and 163 students who entered kindergarten in 1980-81 were in grade 2 in 1984-85.

Grade retention by day care groups showed the largest percentage for the no-day-care group (35 percent), the second largest percentage occurred for the Atlanta Public Schools day care group (26 percent), and there were 22 percent retained one or more times for the non-Atlanta Public Schools day care group.

Sixty-one of the 3,383 students in the sample (2 percent) were in a self-contained special education class in 1984-85. Ten of the students were from the Atlanta Public

TABLE 4
DESCRIPTIVE STATISTICS
KINDERGARTEN STUDENTS WHO ATTENDED ATLANTA PUBLIC SCHOOLS FOR FIVE CONSECUTIVE YEARS, 1980-81 TO 1984-85
Description of Sample

DAY CARE EXPERIENCE	ORIGINAL SAMPLE KDG. 1980-81		STUDY SAMPLE END OF FIVE YEARS	
	N	%	N	%
Atlanta Public Schools (APS)	846	18	610	18
Non-Atlanta Public Schools (Non-APS)	1,949	41	1,355	40
No or Less Than Six Months (No-DC)	1,964	41	1,418	42
TOTAL	4,759	100	3,383	100

DAY CARE EXPERIENCE	TOTAL GROUP		NOT RETAINED		RETAINED ONE TIME		RETAINED MORE THAN ONE TIME		SELF-CONTAINED SPECIAL EDUCATION	
	N	%	N	% of Group	N	% of Group	N	% of Group	N	% of Group
Atlanta Public Schools (APS)	610	18	436	72	143	23	21	03	10	02
Non-Atlanta Public Schools (Non-APS)	1,355	40	1,042	77	256	19	44	03	13	01
No or Less Than Six Months (No-DC)	1,418	42	876	62	406	28	98	07	38	03
TOTAL SAMPLE	3,383	100	2,354	69	805	24	163	05	61	02

Schools day care group, 13 from the non-Atlanta Public Schools group and 38 from the no-day-care group.

Tables 5 and 6 provided the reading and mathematics achievement respectively as measured by the California Achievement Tests for students who entered kindergarten in 1980-81 and progressed to grade 4 in 1984-85. This group of students was not retained during the five-year period.

The analysis of variance to test the difference among the mean NCE scores for the three day care groups showed a statistically significant difference in reading and mathematics achievement for each year from 1980-81 to 1984-85.

The multiple comparisons of group reading mean NCE scores in Table 5 showed significant difference in favor of the Atlanta Public Schools day care group when compared to the no-day-care group at kindergarten, grade 2, and grade 3. At kindergarten, differences in reading achievement among the three groups were significant in favor of day care when compared to no day care. There was no significant difference between the reading achievement of the Atlanta Public Schools day care group and the non-Atlanta Public Schools day care group. At grades 1 and 4, the impact of day care was greater for the non-Atlanta Public Schools group.

At each grade level from 1980-81 to 1984-85, the mean reading achievement was highest for the non-Atlanta Public Schools day care group, and the Atlanta Public Schools day care group earned higher mean reading NCE scores than the no-day-care group. The multiple comparisons of group achievement gains over the five-year period showed negative gains, as the reading mean NCE score decreased each year for each of the day care groups.

The data in Table 6 for mathematics showed that the day care experience did not influence the achievement of the Atlanta Public Schools day care students when compared to the no-day care group. The impact of day care on mathematics achievement was realized for the non-Atlanta Public Schools day care group at

TABLE 5

READING ACHIEVEMENT BY DAY CARE EXPERIENCE FOR STUDENTS PROMOTED IN KINDERGARTEN THROUGH GRADE 4, 1980-81 TO 1984-85

DAY CARE EXPERIENCE	N	CALIFORNIA ACHIEVEMENT TESTS TOTAL READING MEAN NCE SCORE				
		KDG. 1981	GRADE 1 1982	GRADE 2 1983	GRADE 3 1984	GRADE 4 1985
Atlanta Public Schools (APS)	436	69.34	66.20	61.89	58.03	55.89
Non-Atlanta Public Schools (Non-APS)	1,041	70.41	69.65	64.19	60.46	59.56
No or Less Than Six Months (No-DC)	876	66.27	65.72	59.73	56.17	55.06
Total	2,353	68.67	67.55	62.10	58.42	57.21

SUMMARY ANALYSIS OF VARIANCE, READING MEAN NCE SCORES, TABLE 5

GRADE AND YEAR	D. F.	F RATIO	F PROBABILITY	LEVEL OF SIGNIFICANCE
Kindergarten, 1981	(2) (2292)	11.6560	.0000	.01
Grade 1, 1982	(2) (2288)	18.4538	.0000	.01
Grade 2, 1983	(2) (2261)	16.7379	.0000	.01
Grade 3, 1984	(2) (2276	15.9711	.0000	.01
Grade 4, 1985	(2) (2350)	21.5063	.0000	.01

MULTIPLE COMPARISONS OF GROUP READING MEAN NCE SCORES, TABLE 5

DAY CARE YEAR GROUP	NCE MEAN DIFFERENCE	T VALUE	T PROBABILITY	LEVEL OF SIGNIFICANCE
KINDERGARTEN, 1981 APS vs Non-APS	-1.07	-0992	0.321	NS
APS vs No-DC	3.07	2.774	0.006	01
Non-APS vs No-DC	4.13	4.758	0.000	01
GRADE 1, 1982 APS vs Non-APS	-3.45	-4.033	0.000	01
APS vs No-DC	0.48	0.543	0.587	NS
Non-APS vs No-DC	3.93	5.705	0.000	01
GRADE 2, 1983 APS vs Non-APS	-2.30	-2.39	0.017	05
APS vs No-DC	2.16	2.19	0.029	05
Non-APS vs No-DC	4.46	5.78	0.000	01
GRADE 3, 1984 APS vs Non-APS	-2.43	-2.557	0.011	01
APS vs No-DC	1.86	1.903	0.051	05
Non-APS vs No-DC	4.29	5.626	0.000	.01
GRADE 4, 1985 APS vs Non-APS	-3.67	-4.103	0.000	.01
APS vs No-DC	0.83	0.909	0.364	NS
Non-APS vs No-DC	4.50	6.266	0.000	01

MULTIPLE COMPARISONS OF GROUP READING NCE GAINS, TABLE 5

DAY CARE YEAR GROUP	NCE GAIN DIFFERENCE	T VALUE	T PROBABILITY	LEVEL OF SIGNIFICANCE
KINDERGARTEN, 1981 APS vs Non-APS				
APS VS No-DC				
Non-APS vs No-DC				
GRADE 1, 1982 APS vs Non-APS	-2.07	-1.932	0.053	NS
APS vs No-DC	-2.47	-2.247	0.025	05
Non-APS vs No-DC	-0.41	-0.469	0.639	NS
GRADE 2, 1983 APS vs Non-APS	1.44	1.610	0.107	NS
APS vs No-DC	2.01	2.185	0.029	.05
Non-APS vs No-DC	0.57	0.790	0.429	NS
GRADE 3, 1984 APS vs Non-APS	-0.37	-0.443	0.658	NS
APS vs No-DC	-0.52	-0.594	0.552	NS
Non-APS vs No-DC	-0.14	-0.209	0.835	NS
GRADE 4, 1985 APS vs Non-APS	-1.09	-1.320	0.187	NS
APS vs No-DC	0.95	-1.222	0.262	NS
Non-APS vs No-DC	0.14	0.208	0.835	NS

TABLE 6

MATHEMATICS ACHIEVEMENT BY DAY CARE EXPERIENCE FOR STUDENTS PROMOTED IN KINDERGARTEN THROUGH GRADE 4, 1980-81 TO 1984-85

DAY CARE EXPERIENCE	N	CALIFORNIA ACHIEVEMENT TESTS TOTAL MATHEMATICS MEAN NCE SCORE				
		KDG. 1981	GRADE 1 1982	GRADE 2 1983	GRADE 3 1984	GRADE 4 1985
Atlanta Public Schools (APS)	436	67.51	70.82	63.42	62.56	61.22
Non-Atlanta Public Schools (Non-APS)	1,042	69.33	72.38	64.60	63.88	64.10
No or Less Than Six Months (No-DC)	875	66.13	69.75	61.70	62.05	60.83
Total	2,353	67.80	71.12	63.30	62.96	62.35

SUMMARY ANALYSIS OF VARIANCE, MATHEMATICS MEAN NCE SCORES, TABLE 6

GRADE AND YEAR	D. F.	F RATIO	F PROBABILITY	LEVEL OF SIGNIFICANCE
Kindergarten, 1981	(2) (2302)	5.3151	.0050	.01
Grade 1, 1982	(2) (2284)	5.8657	.0029	.01
Grade 2, 1983	(2) (2257)	8.1305	.0003	.01
Grade 3, 1984	(2) (2275)	3.0643	.0469	.05
Grade 4, 1985	(2) (2348)	8.6963	.0002	.01

MULTIPLE COMPARISONS OF GROUP MATHEMATICS MEAN NCE SCORES, TABLE 6

DAY CARE YEAR GROUP	NCE MEAN DIFFERENCE	T VALUE	T PROBABILITY	LEVEL OF SIGNIFICANCE
KINDERGARTEN, 1981 APS vs Non-APS	-1.82	-1.492	0.136	NS
APS VS No-DC	1.38	1.099	0.272	NS
Non-APS vs No-DC	3.20	3.245	0.001	.01
GRADE 1, 1982 APS vs Non-APS	-1.56	-1.625	0.104	NS
APS vs No-DC	1.07	1.081	0.280	NS
Non-APS vs No-DC	2.63	3.401	0.001	.01
GRADE 2, 1983 APS vs Non-APS	-1.18	-1.312	0.190	NS
APS vs No-DC	1.72	1.868	0.062	NS
Non-APS vs No-DC	2.90	4.029	0.000	.01
GRADE 3, 1984 APS vs Non-APS	-1.32	-1.397	0.163	NS
APS vs No-DC	0.51	0.525	0.599	NS
Non-APS vs No-DC	1.83	2.413	0.016	.05
GRADE 4, 1985 APS vs Non-APS	-2.88	-2.780	0.005	.01
APS vs No-DC	0.39	0.357	0.721	NS
Non-APS vs No-DC	3.27	3.912	0.000	.01

MULTIPLE COMPARISONS OF GROUP MATHEMATICS NCE GAINS, TABLE 6

DAY CARE YEAR GROUP	NCE GAIN DIFFERENCE	T VALUE	T PROBABILITY	LEVEL OF SIGNIFICANCE
KINDERGARTEN, 1981 APS vs Non-APS				
APS VS No-DC				
Non-APS vs No-DC				
GRADE 1, 1982 APS vs Non-APS	-0.47	-0.370	0.711	NS
APS vs No-DC	-0.54	-0.409	0.683	NS
Non-APS vs No-DC	-1.01	-0.978	0.328	NS
GRADE 2, 1983 APS vs Non-APS	0.49	0.485	0.627	NS
APS vs No-DC	0.69	0.670	0.503	NS
Non-APS vs No-DC	0.20	0.254	0.800	NS
GRADE 3, 1984 APS vs Non-APS	-0.33	-0.351	0.726	NS
APS vs No-DC	-1.23	-1.261	0.201	NS
Non-APS vs No-DC	-0.90	-1.178	0.239	NS
GRADE 4, 1985 APS vs Non-APS	-1.45	-1.620	0.105	NS
APS vs No-DC	-0.01	-0.011	0.991	NS
Non-APS vs No-DC	1.44	2.002	0.045	.05

grades kindergarten through 3 when compared to the no-day-care group. At grade 4 only, the performance of the non-Atlanta Public Schools day care group was higher than that of the Atlanta Public Schools day care group. The multiple comparisons of group mathematics gains showed a difference only at grade 4 in favor of the non-Atlanta Public Schools day care group as compared to the no-day-care group. Comparisons of achievement gains between day care groups were nonsignificant.

The reading and mathematics performance for the 1980-81 kindergarten students who were retained one time during the five-year period showed a significant difference among day care groups for reading only, and the achievement differences occurred at kindergarten and first grade (Tables 7 and 8).

The benefits derived from grade retention was in favor of the Atlanta Public Schools day care group, as the multiple comparisons of group reading means in Table 7 showed a significant difference for the Atlanta Public Schools day care group at kindergarten and grade 1 when compared to the no-day-care group. The multiple comparisons of group reading gains were nonsignificant at each grade level.

Tables 9 and 10 provided the reading and mathematics achievement respectively for the 1980-81 kindergarten students who were retained more than one time during the five-year period.

Differences in reading and mathematics achievement among the groups occurred during 1983, the third year of school for the students. The reading and mathematics achievement differences were in favor of the non-Atlanta Public Schools day care group only when compared to the no-day-care group. The achievement gains made by students as they progressed through the third (1983) and the fourth (1984) years of school had a significant impact for the Atlanta Public Schools and the no-day-care group for reading and for each of the three groups for mathematics.

An examination of the reading and mathematics data in Tables 4 through 10 for the sample of 3,383 students who entered kindergarten in 1980-81 indicated the impact of day care experience on achievement for students who remained in the Atlanta Public Schools for five consecutive years.

TABLE 7

READING ACHIEVEMENT BY DAY CARE EXPERIENCE FOR STUDENTS RETAINED ONE TIME, 1980-81 TO 1984-85

DAY CARE EXPERIENCE	N	CALIFORNIA ACHIEVEMENT TESTS TOTAL READING MEAN NCE SCORE				
		KDG. 1981	GRADES KDG., 1 1982	GRADES 1, 2 1983	GRADES 2, 3 1984	GRADE 3 1985
Atlanta Public Schools (APS)	143	51.29	49.61	50.51	48.23	47.36
Non-Atlanta Public Schools (Non-APS)	256	49.15	46.86	48.97	48.11	47.88
No or Less Than Six Months (No-DC)	405	46.75	45.67	49.43	48.50	47.10
Total	804	48.36	46.77	49.48	48.33	47.39

SUMMARY ANALYSIS OF VARIANCE, READING MEAN NCE SCORES, TABLE 7

GRADE AND YEAR	D. F.	F RATIO	F PROBABILITY	LEVEL OF SIGNIFICANCE
Kindergarten, 1981	(2) (769)	3.2050	.0411	.05
Grades Kdg. & 1, 1982	(2) (763)	2.8022	.0503	.05
Grades 1 and 2, 1983	(2) (775)	.3329	.7170	NS
Grades 2 and 3, 1984	(2) (768)	.0488	.9524	NS
Grade 3 , 1985	(2) (801)	.1952	.8227	NS

MULTIPLE COMPARISONS OF GROUP READING MEAN NCE SCORES, TABLE 7

DAY CARE YEAR GROUP	NCE MEAN DIFFERENCE	T VALUE	T PROBABILITY	LEVEL OF SIGNIFICANCE
KINDERGARTEN, 1981 APS vs Non-APS	2.14	1.064	0.288	NS
APS VS No-DC	4.54	2.404	0.016	05
Non-APS vs No-DC	2.40	1.541	0.124	NS
GRADES Kdg. and 1, 1982 APS vs Non-APS	2.75	1.540	0.124	NS
APS vs No-DC	3.94	2.365	0.018	05
Non-APS vs No-DC	1.19	0.862	0.389	NS
GRADES 1 and 2, 1983 APS vs Non-APS	1.54	0.813	0.417	NS
APS vs No-DC	1.08	0.614	0.540	NS
Non-APS vs No-DC	-0.46	-0.315	0.753	NS
GRADES 2, and 3, 1984 APS vs Non-APS	0.12	0.072	0.945	NS
APS vs No-DC	-0.27	-0.174	0.862	NS
Non-APS vs No-DC	-0.39	-0.302	0.763	NS
GRADE 3, 1985 APS vs Non-APS	-0.52	-0.314	0.753	NS
APS vs No-DC	0.26	0.175	0.861	NS
Non-APS vs No-DC	0.78	0.624	0.533	NS

MULTIPLE COMPARISONS OF GROUP READING NCE GAINS, TABLE 7

DAY CARE YEAR GROUP	NCE GAIN DIFFERENCE	T VALUE	T PROBABILITY	LEVEL OF SIGNIFICANCE
KINDERGARTEN, 1981 APS vs Non-APS				
APS VS No-DC				
Non-APS vs No-DC				
GRADES Kdg. and 1, 1982 APS vs Non-APS	1.12	0.498	0.619	NS
APS vs No-DC	-0.15	-0.073	0.942	NS
Non-APS vs No-DC	-1.27	-0.726	0.468	NS
GRADES 1 and 2, 1983 APS vs Non-APS	-1.73	-0.625	0.532	NS
APS vs No-DC	-3.22	-1.248	0.213	NS
Non-APS vs No-DC	-1.49	-0.699	0.485	NS
GRADES 2 and 3, 1984 APS vs Non-APS	-1.43	-0.691	0.490	NS
APS vs No-DC	-0.82	-0.426	0.670	NS
Non-APS vs No-DC	0.61	0.379	0.705	NS
GRADE 3, 1985 APS vs Non-APS	-0.74	-0.410	0.682	NS
APS vs No-DC	0.26	0.152	0.879	NS
Non-APS vs No-DC	1.00	0.711	0.477	NS

TABLE 8

MATHEMATICS ACHIEVEMENT BY DAY CARE EXPERIENCE FOR STUDENTS RETAINED ONE TIME, 1980-81 TO 1984-85

DAY CARE EXPERIENCE	N	CALIFORNIA ACHIEVEMENT TESTS TOTAL MATHEMATICS MEAN NCE SCORE				
		KDG. 1981	GRADES KDG.,1 1982	GRADES 1, 2 1983	GRADES 2, 3 1984	GRADE 3 1985
Atlanta Public Schools (APS)	143	51.82	52.44	58.66	57.04	53.04
Non-Atlanta Public Schools (Non-APS)	256	52.31	51.34	55.99	54.99	5439.
No or Less Than Six Months (No-DC)	406	50.52	51.46	56.69	54.40	53.72
Total	805	51.34	51.60	56.59	55.07	53.81

SUMMARY ANALYSIS OF VARIANCE, MATHEMATICS MEAN NCE SCORES, TABLE 8

GRADE AND YEAR		D. F.	F RATIO	F PROBABILITY	LEVEL OF SIGNIFICANCE
Kindergarten,	1981	(2) (772)	.4889	.6135	NS
Grades Kdg. & 1,	1982	(2) (762)	.1823	.8334	NS
Grades 1, and 2,	1983	(2) (772)	1.3868	.2505	NS
Grades 2, and 3	1984	(2) (766)	1.1561	.3152	NS
Grade 3,	1985	(2) (802)	.3073	.7355	NS

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MULTIPLE COMPARISONS OF GROUP MATHEMATICS MEAN NCE SCORES, TABLE 8

DAY CARE YEAR GROUP	NCE MEAN DIFFERENCE	T VALUE	T PROBABILITY	LEVEL OF SIGNIFICANCE
KINDERGARTEN, 1981 APS vs Non-APS	-0.49	-0.201	0.841	NS
APS VS No-DC	1.30	0.570	0.569	NS
Non-APS vs No-DC	1.79	0.950	0.342	NS
GRADES Kdg. and 1, 1982 APS vs Non-APS	1.10	0.565	0.573	NS
APS vs No-DC	0.98	0.542	0.588	NS
Non-APS vs No-DC	-0.12	-0.076	0.939	NS
GRADES 1 and 2, 1983 APS vs Non-APS	3.37	1.660	0.097	NS
APS vs No-DC	1.97	1.042	0.298	NS
Non-APS vs No-DC	-1.40	-0.899	0.369	NS
GRADES 2, and 3, 1984 APS vs Non-APS	2.05	1.099	0.272	NS
APS vs No-DC	2.64	1.518	0.129	NS
Non-APS vs No-DC	0.59	0.405	0.686	NS
GRADE 3, 1985 APS vs Non-APS	-1.35	-0.768	0.443	NS
APS vs No-DC	-0.68	-0.414	0.679	NS
Non-APS vs No-DC	0.67	0.500	0.617	NS

MULTIPLE COMPARISONS OF GROUP MATHEMATICS NCE GAINS, TABLE 8

DAY CARE YEAR GROUP	NCE GAIN DIFFERENCE	T VALUE	T PROBABILITY	LEVEL OF SIGNIFICANCE
KINDERGARTEN, 1981 APS vs Non-APS				
APS VS No-DC				
Non-APS vs No-DC				
GRADES Kdg. and 1, 1982 APS vs Non-APS	1.91	0.697	0.486	NS
APS vs No-DC	-0.02	-0.007	0.994	NS
Non-APS vs No-DC	-1.93	-0.900	0.368	NS
GRADES 1 and 2, 1983 APS vs Non-APS	1.58	0.546	0.585	NS
APS vs No-DC	0.90	0.335	0.738	NS
Non-APS vs No-DC	-0.67	-0.302	0.763	NS
GRADES 2 and 3, 1984 APS vs Non-APS	-0.80	-0.345	0.730	NS
APS vs No-DC	0.94	0.439	0.661	NS
Non-APS vs No-DC	1.74	0.972	0.331	NS
GRADE 3, 1985 APS vs Non-APS	-3.36	-1.593	0.112	NS
APS vs No-DC	-3.22	-1.637	0.102	NS
Non-APS vs No-DC	0.14	0.088	0.930	NS

TABLE 9

READING ACHIEVEMENT BY DAY CARE EXPERIENCE FOR STUDENTS RETAINED MORE THAN ONE TIME, 1980-81 TO 1984-85

DAY CARE EXPERIENCE	N	CALIFORNIA ACHIEVEMENT TESTS TOTAL READING MEAN NCE SCORE				
		KDG. 1981	GRADES KDG.,1 1982	GRADES 1, 2 1983	GRADES 2, 3 1984	GRADE 2 1985
Atlanta Public Schools (APS)	21	35.16	34.59	40.21	45.81	46.14
Non-Atlanta Public Schools (Non-APS)	44	38.32	33.23	46.97	40.35	46.34.
No or Less Than Six Months (No-DC)	98	34.10	31.85	38.43	46.58	46.36
Total	163	35.42	32.58	40.88	44.84	46.33

SUMMARY ANALYSIS OF VARIANCE, READING MEAN NCE SCORES, TABLE 9

GRADE AND YEAR		D. F.	F RATIO	F PROBABILITY	LEVEL OF SIGNIFICANCE
Kindergarten,	1981	(2) (144)	.6969	.4998	NS
Grades Kdg. & 1,	1982	(2) (134)	.2317	.7935	NS
Grades 1, and 2,	1983	(2) (147)	4.2893	.0155	.05
Grades 1, and 2	1984	(2) (149)	1.9423	.1470	NS
Grade 2	1985	(2) (160)	.0017	.9983	NS

MULTIPLE COMPARISONS OF GROUP READING MEAN NCE SCORES, TABLE 9

DAY CARE YEAR GROUP	NCE MEAN DIFFERENCE	T VALUE	T PROBABILITY	LEVEL OF SIGNIFICANCE
KINDERGARTEN, 1981 APS vs Non-APS	-3.16	-0.603	0.547	NS
APS VS No-DC	1.06	0.221	0.826	NS
Non-APS vs No-DC	4.22	1.179	0.240	NS
GRADES Kdg. and 1, 1982 APS vs Non-APS	1.36	0.281	0.779	NS
APS vs No-DC	2.74	0.617	0.538	NS
Non-APS vs No-DC	1.38	0.426	0.671	NS
GRADES 1 and 2, 1983 APS vs Non-APS	-6.76	-1.581	0.116	NS
APS vs No-DC	1.78	0.461	0.646	NS
Non-APS vs No-DC	8.54	2.922	0.004	01
GRADES 1 and 2, 1984 APS vs Non-APS	5.46	1.203	0.231	NS
APS vs No-DC	-0.77	-0.190	0.850	NS
Non-APS vs No-DC	-6.23	-1.950	0.053	NS
GRADE 2, 1985 APS vs Non-APS	-0.20	-0.049	0.961	NS
APS vs No-DC	-0.22	-0.058	0.954	NS
Non-APS vs No-DC	-0.02	-0.006	0.995	NS

MULTIPLE COMPARISONS OF GROUP READING NCE GAINS, TABLE 9

DAY CARE YEAR GROUP	NCE GAIN DIFFERENCE	T VALUE	T PROBABILITY	LEVEL OF SIGNIFICANCE
KINDERGARTEN, 1981 APS vs Non-APS				
APS VS No-DC				
Non-APS vs No-DC				
GRADES Kdg. and 1, 1982 APS vs Non-APS	5.51	0.828	0.409	NS
APS vs No-DC	5.22	0.853	0.396	NS
Non-APS vs No-DC	-0.29	-0.064	0.949	NS
GRADES 1 and 2, 1983 APS vs Non-APS	-8.54	-1.362	0.176	NS
APS vs No-DC	-1.96	-0.341	0.734	NS
Non-APS vs No-DC	6.58	1.597	0.113	NS
GRADES 1 and 2, 1984 APS vs Non-APS	15.48	2.564	0.011	.05
APS vs No-DC	0.33	0.060	0.952	NS
Non-APS vs No-DC	-15.15	-3.597	0.000	01
GRADE 2, 1985 APS vs Non-APS	-5.59	-1.015	0.312	NS
APS vs No-DC	0.17	0.034	0.973	NS
Non-APS vs No-DC	5.76	1.482	0.140	NS

TABLE 10

MATHEMATICS ACHIEVEMENT BY DAY CARE EXPERIENCE FOR STUDENTS RETAINED MORE THAN ONE TIME, 1980-81 TO 1984-85

DAY CARE EXPERIENCE	N	CALIFORNIA ACHIEVEMENT TESTS TOTAL MATHEMATICS MEAN NCE SCORE				
		KDG. 1981	GRADES KDG., 1 1982	GRADES 1, 2 1983	GRADES 2, 3 1984	GRADE 2 1985
Atlanta Public Schools (APS)	21	35.47	28.47	53.68	54.71	54.38
Non-Atlanta Public Schools (Non-APS)	44	40.86	38.05	59.95	52.13	57.09.
No or Less Than Six Months (No-DC)	98	41.93	33.89	46.30	58.04	55.73
Total	163	40.81	34.29	50.79	56.08	55.93

SUMMARY ANALYSIS OF VARIANCE, MATHEMATICS MEAN NCE SCORES, TABLE 10

GRADE AND YEAR		D. F.	F RATIO	F PROBABILITY	LEVEL OF SIGNIFICANCE
Kindergarten,	1981	(2) (147)	.6271	.5355	NS
Grades Kdg. & 1,	1982	(2) (136)	1.6279	.2001	NS
Grades 1, and 2,	1983	(2) (147)	8.3904	.0004	.01
Grades 1, and 2	1984	(2) (147)	1.0331	.3585	NS
Grade 2	1985	(2) (160)	.2035	.8161	NS

MULTIPLE COMPARISONS OF GROUP MATHEMATICS MEAN NCE SCORES, TABLE 10

DAY CARE YEAR GROUP	NCE MEAN DIFFERENCE	T VALUE	T PROBABILITY	LEVEL OF SIGNIFICANCE
KINDERGARTEN, 1981 APS vs Non-APS	-5.39	-0.858	0.392	NS
APS VS No-DC	-6.46	-1.120	0.265	NS
Non-APS vs No-DC	-1.07	-0.253	0.801	NS
GRADES Kdg. and 1, 1982 APS vs Non-APS	-9.58	-1.780	0.077	NS
APS vs No-DC	-5.42	-1.111	0.269	NS
Non-APS vs No-DC	4.16	1.108	0.270	NS
GRADES 1 and 2, 1983 APS vs Non-APS	-6.27	-1.262	0.209	NS
APS vs No-DC	7.38	1.651	0.101	NS
Non-APS vs No-DC	13.64	4.025	0.000	01
GRADES 1 and 2, 1984 APS vs Non-APS	2.58	0.436	0.664	NS
APS vs No-DC	-3.33	-0.631	0.529	NS
Non-APS vs No-DC	-5.91	-1.404	0.163	NS
GRADE 2, 1985 APS vs Non-APS	-2.71	-0.612	0.541	NS
APS vs No-DC	-1.35	-0.337	0.736	NS
Non-APS vs No-DC	1.36	-0.448	0.655	NS

MULTIPLE COMPARISONS OF GROUP READING NCE GAINS, TABLE 10

DAY CARE YEAR GROUP	NCE GAIN DIFFERENCE	T VALUE	T PROBABILITY	LEVEL OF SIGNIFICANCE
KINDERGARTEN, 1981 APS vs Non-APS				
APS VS No-DC				
Non-APS vs No-DC				
GRADES Kdg. and 1, 1982 APS vs Non-APS	-0.72	-0.091	0.928	NS
APS vs No-DC	3.74	0.518	0.606	NS
Non-APS vs No-DC	4.46	0.824	0.412	NS
GRADES 1 and 2, 1983 APS vs Non-APS	1.75	0.281	0.779	NS
APS vs No-DC	11.48	2.034	0.044	05
Non-APS vs No-DC	9.73	2.266	0.025	05
GRADES 1 and 2, 1984 APS vs Non-APS	10.55	1.605	0.111	NS
APS vs No-DC	-6.16	-1.051	0.295	NS
Non-APS vs No-DC	-16.71	-3.606	0.000	01
GRADE 2, 1985 APS vs Non-APS	-4.62	-0.725	0.469	NS
APS vs No-DC	1.06	0.186	0.853	NS
Non-APS vs No-DC	5.68	1.252	0.212	NS

The impact of day care experience was most noticeable at kindergarten, as achievement differences were significant in the contrast of day care groups with the no-day-care group. The difference in reading and mathematics achievement between the Atlanta Public Schools day care group and the non-Atlanta Public Schools day care group was non-significant at kindergarten for students who were promoted as well as for those who were subsequently retained one or more times.

For students who were promoted from kindergarten through fourth grade, reading achievement during first grade was highest for the non-Atlanta Public Schools day care group. Beyond first grade, the impact of day care experience was noticeable for both of the day care groups for reading achievement at second and third grades. For mathematics, achievement was highest for the non-Atlanta Public Schools day care group only in constrast to the no-day-care group in kindergarten through third grade. The mathematics achievement at fourth grade was significantly higher than that of the Atlanta Public Schools and the no-day-care groups.

The Atlanta Public Schools day care group derived greater achievement outcomes in the significant amount of gain made in reading and mathematics at first and second grades for students retained more than one time during the five-year period.

One-Year Achievement Comparison for Six Kindergarten Groups

The one-year comparison for six groups consisted of students in the kindergarten classes from 1981-82 to 1986-87. Students were grouped by previous day care experience into three comparison groups: Atlanta Public Schools day care, non-Atlanta Public Schools day care, and no day care.

The descriptive statistics for the sample of kindergarten students who attended Atlanta Public Schools for each of the six school years are presented in Table 2. From the original sample of students, reading and mathematics achievement data were obtained for approximately 93 percent of the students (Table 11).

TABLE 11
DESCRIPTION OF THE SAMPLE
Students Who Attended Atlanta Public Schools in the Kindergarten Classes
of 1981-82 to 1986-87

Day Care Experience	Original Sample 1981-82 to 1986-87		Study Sample 1981-82 to 1986-87	
	N	%	N	%
Atlanta Public Schools (APS)	5,287	17	4,989	17
Non-Atlanta Public Schools (Non-APS)	12,969	40	12,163	41
No or Less than Six Months (No-DC)	13,824	43	12,791	42
Total	32,080	100	29,943	100

Tables 12 and 13 provided the reading and mathematics achievement respectively as measured by the California Achievement Tests for students in the kindergarten classes from 1981-82 to 1986-87.

The analysis of variance to test the difference among the mean NCE scores for the three groups showed a statistically significant difference among groups for reading and mathematics for each of the six kindergarten classes from 1981-82 to 1986-87.

The multiple comparisons of group reading mean NCE scores in Table 12 showed significant difference in reading achievement in favor of the Atlanta Public Schools day care group when compared to the no-day-care group.

Differences in reading achievement were also significant in favor of the non-Atlanta Public Schools day care group when compared to no day care. The comparison between day care and no day care showed that the reading achievement for each of the two day care groups was higher than reading achievement for the no-day-care group for each of the six kindergarten classes from 1981-82 to 1986-87.

The comparison between the two day care groups showed significant difference in reading achievement in favor of the non-Atlanta Public Schools day care group when compared to the Atlanta Public Schools day care group for four of the six kindergarten classes from 1981-82 to 1986-87.

The data in Table 13 for mathematics showed a significant difference in mathematics achievement among the three groups for each of the six kindergarten classes from 1981-82 to 1986-87. The comparison between day care and no day care showed that the mathematics achievement of the Atlanta Public Schools students was significantly higher than that of the no-day-care group. The mathematics achievement of the non-Atlanta Public Schools day care students was also significantly higher than that of the no-day-care group.

The comparison between the two day care groups showed that there was no significant difference between the mathematics achievement of the Atlanta Public Schools day care students and the non-Atlanta Public Schools day care students for five of the six kindergarten classes from 1981-82 to 1986-87.

The impact of day care on reading and mathematics achievement was evidenced in the comparisons of the performance of kindergarten students who attended day care and students who did not. In the comparison of the performance of students who attended formal day care programs, there was no significant difference in

TABLE 12

READING ACHIEVEMENT BY DAY CARE EXPERIENCE FOR STUDENTS IN KINDERGARTEN, 1981-82 TO 1986-87

DAY CARE EXPERIENCE	CALIFORNIA ACHIEVEMENT TESTS TOTAL READING MEAN NCE SCORE											
	KDG.-82		KDG.-83		KDG.-84		KDG.-85		KDG.-86		KDG.-87	
	N	X	N	X	N	X	N	X	N	X	N	X
Atlanta Public Schools (APS	838	65.1	787	68.4	837	70.5	849	69.6	871	58.7	807	62.8
Non-Atlanta Public Schools (No-APS)	1876	69.0	1792	72.1	1917	71.9	1986	72.1	2390	59.2	2202	65.7
No or Less than Six Months (No-DC)	1679	58.2	1810	61.6	2026	62.8	2357	63.3	2547	53.9	2372	59.2
Total	4,393	64.1	4,389	67.3	4,780	67.8	5,192	67.7	5,808	56.8	5,381	62.4

SUMMARY ANALYSIS OF VARIANCE FOR READING NCE SCORES, TABLE 12

GRADE AND YEAR	DF	F RATIO	F PROBABILITY	LEVEL OF SIGNIFICANCE
KINDERGARTEN 1982	(2) (4390)	106.3840	.0000	.01
KINDERGARTEN 1983	(2) (4486)	110.0027	.0000	.01
KINDERGARTEN 1984	(2) (4777)	95.3989	.0000	.01
KINDERGARTEN 1985	(2) (5189)	92.9237	.0000	.01
KINDERGARTEN 1986	(2) (5805)	39.1697	.0000	.01
KINDERGARTEN 1987	(2) (5378)	48.3844	.0000	.01

MULTIPLE COMPARISONS OF GROUP READING MEAN NCE SCORES, TABLE 12

DAY CARE EXPERIENCE	NCE MEAN DIFFERENCE	T VALUE	T PROBABILITY	LEVEL OF SIGNIFICANCE
KINDERGARTEN 1981-82				
APS vs Non-APS	-3.90	-4.247	0.000	.01
APS vs No-Dc	6.88	7.360	0.000	.01
Non-APS vs No-DC	10.79	14.519	0.000	.01
KINDERGARTEN 1982-83				
APS vs Non-APS	-3.74	-3.999	0.000	.01
APS vs No-DC	6.84	7.375	0.000	.01
Non-APS vs No-DC	10.58	14.698	0.000	.01
KINDERGARTEN 1983-84				
APS vs Non-APS	-1.49	-.1.648	0.099	NS
APS vs No-DC	7.70	8.612	0.000	.01
Non-APS vs No-DC	9.19	13.249	0.000	.01
KINDERGARTEN 1984-85				
APS vs Non-APS	-2.49	-2.822	0.005	.05
APS vs No-DC	6.27	7.263	0.000	.01
Non-APS vs No-DC	8.76	13.343	0.000	.01
KINDERGARTEN 1985-86				
APS vs Non-APS	-0.44	-0.500	0.617	NS
APS vs No-DC	4.87	5.584	0.000	.01
Non-APS vs No-DC	5.32	8.391	0.000	.01
KINDERGARTEN 1986-87				
APS vs Non-APS	-2.96	-3.202	.0001	.01
APS vs No-DC	3.57	3.901	.0000	.01
Non-APS vs No-DC	6.53	9.824	.000	.01

TABLE 13

MATHEMATICS ACHIEVEMENT BY DAY CARE EXPERIENCE FOR STUDENTS IN KINDERGARTEN , 1981-82 TO 1986-87

DAY CARE EXPERIENCE	CALIFORNIA ACHIEVEMENT TESTS TOTAL MATHEMATICS MEAN NCE SCORE											
	KDG.-82		KDG.-83		KDG.-84		KDG.-85		KDG.-86		KDG.-87	
	N	X	N	X	N	X	N	X	N	X	N	X
Atlanta Public Schools (APS)	837	66.2	789	71.4	837	71.9	849	72.0	870	66.6	805	66.6
Non-Atlanta Public Schools (Non-APS)	1877	69.0	1797	71.3	1925	72.2	1992	72.8	2381	65.9	2196	67.1
No or Less than Six Months (No-DC)	1679	60.0	1815	63.4	2034	65.2	2371	66.2	2547	59.6	2370	61.5
Total	4,393	64.9	4,401	68.2	4,796	69.2	5,212	69.7	5,798	63.3	5,371	64.5

SUMMARY ANALYSIS OF VARIANCE FOR MATHEMATICS NCE SCORES, TABLE 13

GRADE AND YEAR	DF	F RATIO	F PROBABILITY	LEVEL OF SIGNIFICANCE
KINDERGARTEN 1982	(2) (4390)	70.8013	.0000	.01
KINDERGARTEN 1983	(2) (4498)	62.8368	.0000	.01
KINDERGARTEN 1984	(2) 4793)	51.6650	.0000	.01
KINDERGARTEN 1985	(2) (5209)	49.8327	.0000	.01
KINDERGARTEN 1986	(2) (5795)	68.5353	.0000	.01
KINDERGARTEN 1987	(2) 5368)	44.9170	.0000	.01

MULTIPLE COMPARISONS OF GROUP MATHEMATICS MEAN NCE SCORES, TABLE 13

DAY CARE EXPERIENCE	NCE MEAN DIFFERENCE	T VALUE	T PROBABILITY	LEVEL OF SIGNIFICANCE
KINDERGARTEN 1981-82				
APS vs Non-APS	-2.76	-2.815	0.005	.01
APS vs No-DC	6.56	6.572	0.000	.01
Non-APS vs No-DC	9.33	11.761	0.000	.01
KINDERGARTEN 1982-83				
APS vs Non-APS	0.12	0.117	0.907	NS
APS vs No-DC	8.01	8.071	0.000	.01
Non-APS vs No-DC	7.89	10.243	0.000	.01
KINDERGARTEN 1983-84				
APS vs Non-APS	-0.25	-0.263	0.793	NS
APS vs No-DC	6.74	7.045	0.000	.01
Non-APS vs No-DC	6.99	9.441	0.000	.01
KINDERGARTEN 1984-85				
APS vs Non-APS	-0.79	-0.850	0.395	NS
APS vs No-DC	5.74	6.307	0.000	.01
Non-APS vs No-DC	6.53	9.446	0.000	.01
KINDERGARTEN 1985-86				
APS vs Non-APS	0.62	0.740	0.459	NS
APS vs No-DC	6.95	8.420	0.000	.01
Non-APS vs No-DC	6.34	10.571	0.000	.01
KINDERGARTEN 1986-87				
APS vs Non-APS	-0.53	-0.610	0.542	NS
APS vs No-DC	5.06	5.920	0.000	.01
Non-APS vs No-DC	5.59	9.003	0.000	.01

Only reading achievement was higher for the non-Atlanta Public Schools students when compared to the Atlanta Public Schools day care group for the kindergarten classes from 1981-82 to 1986-87.

Achievement for Eight Waves of Atlanta Public Schools Day Care Students

Table 3 provided the descriptive statistics for the groups of Atlanta Public Schools day care students who entered kindergarten in eight waves from 1972-73 to 1979-80. From the original sample of students identified from day care records, reading and mathematics achievement data for 1980-81 to 1984-85 were obtained for 87 percent of the group (Table 14).

The analysis of student achievement for reading and mathematics examined the average group performance which was at or above the national norm level, examined the achievement gains for each group across the five-year period from 1980-81 to 1984-85, and made a comparison of the mean performance of Atlanta Public Schools day care students with the mean performance for students in the school system who were at the same grade level.

Reading Achievement

Table 15 showed that from 1980-81 to 1984-85, waves of student groups were in grades 1 through 12. With a mean NCE score of 50 to indicate the national norm level of performance, only students in grades 1 through 5 earned reading achievement scores at or above the national norm. Students in wave 8 entered kindergarten in 1979-80 constituted the first group of students to progress from grade 1 through 5 under the school system's Pupil Progression Policy. The Pupil Progression Policy stipulated satisfactory performance on reading and mathematics skills and satisfactory progress in the reading textbook. The Atlanta Public Schools day care students in grades 1 through 5 in wave 8 earned reading achievement scores above the national norm level for each of the five years. The group with the second highest level of achievement over the five-year period was wave 7, in which students entered kindergarten in 1978-79. Second and fifth grade students in wave 7 were above the national norm level. As waves of students progressed from grade 6 through 12, there was a decline in the average group performance for reading on the California Achievement Tests.

The examination of the performance of Atlanta Public Schools day care students across the five-year period showed a fluctuating pattern in which the average reading achievement increased in grades 1 through 5, decreased at grade 6,

TABLE 14

DESCRIPTION OF THE SAMPLE

ATLANTA PUBLIC SCHOOLS DAY CARE STUDENTS WHO ENTERED KINDERGARTEN FROM 1972-73 TO 1979-80

GROUP	ORIGINAL SAMPLE 1972-73 TO 1979-80		STUDY SAMPLE 1972-73 TO 1979-80	
	N	%	N	%
WAVE 1 (KDG. 1972-73)	196	14	149	12
WAVE 2 (KDG. 1973-74)	226	16	211	17
WAVE 3 (KDG. 1974-75)	101	07	99	08
WAVE 4 (KDG. 1975-76)	466	32	376	30
WAVE 5 (KDG. 1976-77)	85	06	85	07
WAVE 6 (KDG. 1977-78)	88	06	83	06
WAVE 7 (KDG. 1978-79)	87	06	84	07
WAVE 8 (KDG. 1979-80)	190	13	161	13
TOTAL	1,439	100	1,248	100

TABLE 15

READING ACHIEVEMENT BY WAVE GROUP
1980-81 TO 1984-85

GROUP	READING MEAN NCE SCORE BY GRADE IN 1980-81 TO 1984-85												
	K	1	2	3	4	5	6	7	8	9	10	11	12
WAVE 8		60	55	53	52	54							
WAVE 7			51	48	49	51	49						
WAVE 6				47	48	48	45	46					
WAVE 5					42	46	40	46	45				
WAVE 4						44	42	43	44	43			
WAVE 3							36	40	37	38	38		
WAVE 2								40	40	39	40	41	
WAVE 1									33	33	36	34	36

TABLE 16

READING ACHIEVEMENT BY GRADE LEVEL FOR WAVE GROUPS AND SYSTEM STUDENTS, 1980-81

GRADE LEVEL	GRADE MEAN	CALIFORNIA ACHIEVEMENT TESTS TOTAL READING MEAN NCE SCORE							
		WAVE 8	WAVE 7	WAVE 6	WAVE 5	WAVE 4	WAVE 3	WAVE 2	WAVE 1
K	62								
1	56	60							
2	51		51						
3	46			47					
4	46				42				
5	47					44			
6	44						36		
7	45							40	
8	38								33
9	37								
10	36								
11	36								
12	--								

TABLE 17

READING ACHIEVEMENT BY GRADE LEVEL FOR WAVE GROUPS AND SYSTEM STUDENTS, 1981-82

GRADE LEVEL	GRADE MEAN	CALIFORNIA ACHIEVEMENT TESTS TOTAL READING MEAN NCE SCORE							
		WAVE 8	WAVE 7	WAVE 6	WAVE 5	WAVE 4	WAVE 3	WAVE 2	WAVE 1
K	64								
1	59								
2	56	55							
3	49		48						
4	48			48					
5	50				46				
6	46					42			
7	46						40		
8	42							40	
9	40								33
10	38								
11	38								
12	--								

TABLE 18

READING ACHIEVEMENT BY GRADE LEVEL FOR WAVE GROUPS AND SYSTEM STUDENTS, 1982-83

GRADE LEVEL	GRADE MEAN	CALIFORNIA ACHIEVEMENT TESTS TOTAL READING MEAN NCE SCORE							
		WAVE 8	WAVE 7	WAVE 6	WAVE 5	WAVE 4	WAVE 3	WAVE 2	WAVE 1
K	67								
1	59								
2	56								
3	54	53							
4	49		49						
5	50			48					
6	46				40				
7	46					43			
8	43						37		
9	42							39	
10	41								36
11	39								
12	--								

TABLE 19

READING ACHIEVEMENT BY GRADE LEVEL FOR WAVE GROUPS AND SYSTEM STUDENTS, 1983-84

GRADE LEVEL	GRADE MEAN	CALIFORNIA ACHIEVEMENT TESTS TOTAL READING MEAN NCE SCORE							
		WAVE 8	WAVE 7	WAVE 6	WAVE 5	WAVE 4	WAVE 3	WAVE 2	WAVE 1
K	68								
1	64								
2	56								
3	54								
4	57	52							
5	51		51						
6	47			45					
7	49				46				
8	46					44			
9	44						38		
10	43							40	
11	43								34
12	--								

TABLE 20

READING ACHIEVEMENT BY GRADE LEVEL FOR WAVE GROUPS AND SYSTEM STUDENTS, 1984-85

GRADE LEVEL	GRADE MEAN	CALIFORNIA ACHIEVEMENT TESTS TOTAL READING MEAN NCE SCORE							
		WAVE 8	WAVE 7	WAVE 6	WAVE 5	WAVE 4	WAVE 3	WAVE 2	WAVE 1
K	69								
1	62								
2	61								
3	56								
4	55								
5	60	54							
6	50		49						
7	49			46					
8	47				45				
9	46					43			
10	46						38		
11	45							41	
12	44								36

rebounded at grades 7 and 8, and decreased again at grade 9. The average group reading achievement at the high school grade levels was generally 10 or more NCE points below the national norm level. While the elementary grade levels, maintained a higher level of reading achievement across the five-year period, the middle grades and high school grade levels showed a gain in 1985 when compared to the mean NCE score in 1981.

Table 16 through 20 allowed a comparison of the man reading achievement of Atlanta Public Schools day care students with the mean reading achievement of system students by grade level for each year from 1980-81 to 1984-85.

The mean reading performance for system students was generally higher in grades 1 through 5, showed a decrease in mean NCE scores beyond grade 6, and were generally lowest at the high school grade levels A similar pattern of performance occurred for Atlanta Public Schools day care students. The mean reading achievement was quite comparable between system students and the Atlanta Public Schools day care students through grade 5. As the level of reading achievement for both groups declined beyond grade 6, the difference between mean NCE scores was greater, and system students earned higher mean NCE scores in grades 6 through 12 than the Atlanta Public Schools day care students.

Mathematics Achievement

The mean mathematics NCE scores for the waves of Atlanta Public Schools day care students who were in grade 1 through 12 from 1980-81 to 1984-85 are provided in Table 21. With a mean NCE score of 50 to indicate the national norm level of performance, the achievement of students was higher for mathematics than for reading. Waves 6, 7 and 8 which consisted of students entering kindergarten in 1977-78, 1978-79 and 1979-80, maintained a level of mathematics achievement at or above the national norm for the five-year period between 1981 and 1985. The students in the three waves were in grades 1 through 7.

Unlike reading achievement scores the mathematics scores for the Atlanta Public Schools day care students were fairly uniform across the five-year period and did not show sharp declines at grades 6 and 9. While the scores for students in the

TABLE 21

MATHEMATICS ACHIEVEMENT BY WAVE GROUP
1980-81 TO 1984-85

GROUP	MATHEMATICS MEAN NCE SCORE BY GRADE IN 1980-81 TO 1984-85												
	K	1	2	3	4	5	6	7	8	9	10	11	12
WAVE 8		61	58	57	60	57							
WAVE 7			51	53	49	53	49						
WAVE 6				54	57	50	50	51					
WAVE 5					46	47	46	49	46				
WAVE 4						46	47	48	46	46			
WAVE 3							39	43	41	42	43		
WAVE 2								43	42	41	44	43	
WAVE 1									35	37	39	40	41

elementary grades were higher, students in grades 6 through 12 showed achievement gains in 1985 when compared to the mean NCE score in 1981.

Tables 22 through 26 allowed for a comparison of the mean mathematics achievement of Atlanta Public Schools day care students with the mean mathematics achievement of system students by grade level for each year from 1980-81 to 1984-85.

Unlike the performance pattern for reading, mathematics achievement was maintained at a fairly consistent level through grade 7, showed a decline at grade 8 and leveled at a uniform performance through the high school grades.

The mean mathematics achievement was quite comparable between system students and the Atlanta Public Schools day care students through grade 5. At grade 6 and beyond, the difference between mean NCE scores was greater, and system students earned higher mean NCE scores in the middle and high school grades than the Atlanta Public Schools day care students.

TABLE 22

MATHEMATICS ACHIEVEMENT BY GRADE LEVEL FOR WAVE GROUPS AND SYSTEM STUDENTS, 1980-81

GRADE LEVEL	GRADE MEAN	CALIFORNIA ACHIEVEMENT TESTS TOTAL MATHEMATICS MEAN NCE SCORE							
		WAVE 8	WAVE 7	WAVE 6	WAVE 5	WAVE 4	WAVE 3	WAVE 2	WAVE 1
K	62								
1	60	61							
2	53		51						
3	51			54					
4	49				46				
5	48					46			
6	45						39		
7	47							43	
8	40								35
9	38								
10	37								
11	37								
12	--								

TABLE 23

MATHEMATICS ACHIEVEMENT BY GRADE LEVEL FOR WAVE GROUPS AND SYSTEM STUDENTS, 1981-82

GRADE LEVEL	GRADE MEAN	CALIFORNIA ACHIEVEMENT TESTS TOTAL MATHEMATICS MEAN NCE SCORE							
		WAVE 8	WAVE 7	WAVE 6	WAVE 5	WAVE 4	WAVE 3	WAVE 2	WAVE 1
K	65								
1	64								
2	59	58							
3	53		53						
4	52			57					
5	52				47				
6	50					47			
7	50						43		
8	44							42	
9	41								37
10	40								
11	39								
12	--								

TABLE 24

MATHEMATICS ACHIEVEMENT BY GRADE LEVEL FOR WAVE GROUPS AND SYSTEM STUDENTS, 1982-83

GRADE LEVEL	GRADE MEAN	CALIFORNIA ACHIEVEMENT TESTS TOTAL MATHEMATICS MEAN NCE SCORE							
		WAVE 8	WAVE 7	WAVE 6	WAVE 5	WAVE 4	WAVE 3	WAVE 2	WAVE 1
K	68								
1	65								
2	60								
3	58	57							
4	51		49						
5	52			50					
6	51				46				
7	51					48			
8	45						41		
9	42							41	
10	41								39
11	41								
12	--								

TABLE 25

MATHEMATICS ACHIEVEMENT BY GRADE LEVEL FOR WAVE GROUPS AND SYSTEM STUDENTS, 1983-84

GRADE LEVEL	GRADE MEAN	CALIFORNIA ACHIEVEMENT TESTS TOTAL MATHEMATICS MEAN NCE SCORE							
		WAVE 8	WAVE 7	WAVE 6	WAVE 5	WAVE 4	WAVE 3	WAVE 2	WAVE 1
K	69								
1	66								
2	62								
3	60								
4	61	60							
5	54		53						
6	52			50					
7	53				49				
8	48					46			
9	45						42		
10	46							44	
11	46								40
12	--								

TABLE 26

MATHEMATICS ACHIEVEMENT BY GRADE LEVEL FOR WAVE GROUPS AND SYSTEM STUDENTS, 1984-85

GRADE LEVEL	GRADE MEAN	CALIFORNIA ACHIEVEMENT TESTS TOTAL MATHEMATICS MEAN NCE SCORE							
		WAVE 8	WAVE 7	WAVE 6	WAVE 5	WAVE 4	WAVE 3	WAVE 2	WAVE 1
K	70								
1	68								
2	65								
3	61								
4	60								
5	64	57							
6	54		49						
7	54			51					
8	50				46				
9	47					46			
10	49						43		
11	48							43	
12	47								41

Variables Not Fully Dependent Upon Achievement Tests Scores

The educational benefits of the Atlanta Public Schools day care program for students included critical variables and intrinsic effects which may not be measured by achievement tests scores.

The variables examined in the study were preassessment at kindergarten entry, patterns of promotion and retention, selection for compensatory education, placement in the Program for Exceptional Children, trends of mobility and stability in school attendance, and the socioeconomic indices which influenced student transfers and withdrawals from school prior to graduation. The schools' holding power was examined in relationship to the number of years students remained in the system, and for the number and percentage of Atlanta Public Schools day care students who were in high school graduation classes.

With the 1980-81 kindergarten class as the unit of analysis, a greater proportion of students who attended Atlanta Public Schools day care (74 percent) remained enrolled in the school system through 1986-87. A slightly lower proportion of the no-day-care group (71 percent) remained enrolled in the school system over the seven-year period. The greatest student loss over the seven-year period occurred for the non-Atlanta Public Schools day care group. Forty-six percent of the 1980-81 kindergarten students who withdrew before 1987-88 attended non-Atlanta Public Schools day care prior to entering school.

TABLE 27

THE 1980-81 KINDERGARTEN CLASS - STUDENTS WHO ATTENDED ATLANTA PUBLIC SCHOOLS FROM 1980-81 TO 1986-87

DAY CARE EXPERIENCE	ORIGINAL SAMPLE IN 1980-81		STUDENTS WITHDRAWN PRIOR TO 1987-88		STUDENTS REMAINED IN 1987-88		STUDENTS ATTENDED 1980-81 TO 1986-87	
	N	%	N	%	N	%	N	%
Atlanta Public Schools (APS Day Care)	789	17	203	14	586	18	586	74
Non-Atlanta Public Schools (Non-APS)	1,939	41	664	46	1,275	39	1,275	66
No or Less Than Six Months (No-Day Care)	1,959	42	574	40	1,385	43	1,385	71
Subtotal	4,687	100	1,441	100	3,246	100	3,246	69
Lost to Sample	72							
TOTAL	4,759							

The kindergarten preassessment program was geared toward measuring the functional level of students through screenings for vision, hearing, and dental, health, and through the assessment of gross motor and fine motor development and prereading readiness.

The Ready Steps Language Survey was administered by classroom teachers as initial screening in the fall of the school year for entering kindergarten students. The Ready Steps Language Survey (formerly the Test For Ready Steps) was an individually administered diagnostic test to determine a child's readiness for the Houghton Mifflin's Getting Ready To Read program or other prereading programs. The instrument consisted of ten subtests--one for each of the ten skill areas considered prerequisite to prereading: auditory discrimination, following oral directions, instructional language, general vocabulary, oral language development, listening comprehension, sequencing, categorizing, using oral context, and letter form discrimination.

The trend of performance on the Ready Steps Language Survey for kindergarten students in each of the three groups is depicted in Figures 1 and 2. Students in 1981 and 1986 generally had lower assessment scores for skill no. 3, instructional language; skill no. 5, oral language development; skill no. 6, listening comprehension; and skill no. 7, sequencing. The pattern of performance on the ready steps skills was quite similar for the the Atlanta Public Schools day care students and the non-Atlanta Public Schools day care students. Students with no or less than six months of day care experienced the greatest difficulty with the 10 ready step skills at kindergarten entry (Appendixes C and D).

Figure 1. READY STEPS LANGUAGE SURVEY - PERCENT OF KINDERGARTEN STUDENTS MASTERING SKILLS BY DAY CARE GROUP, FALL 1986

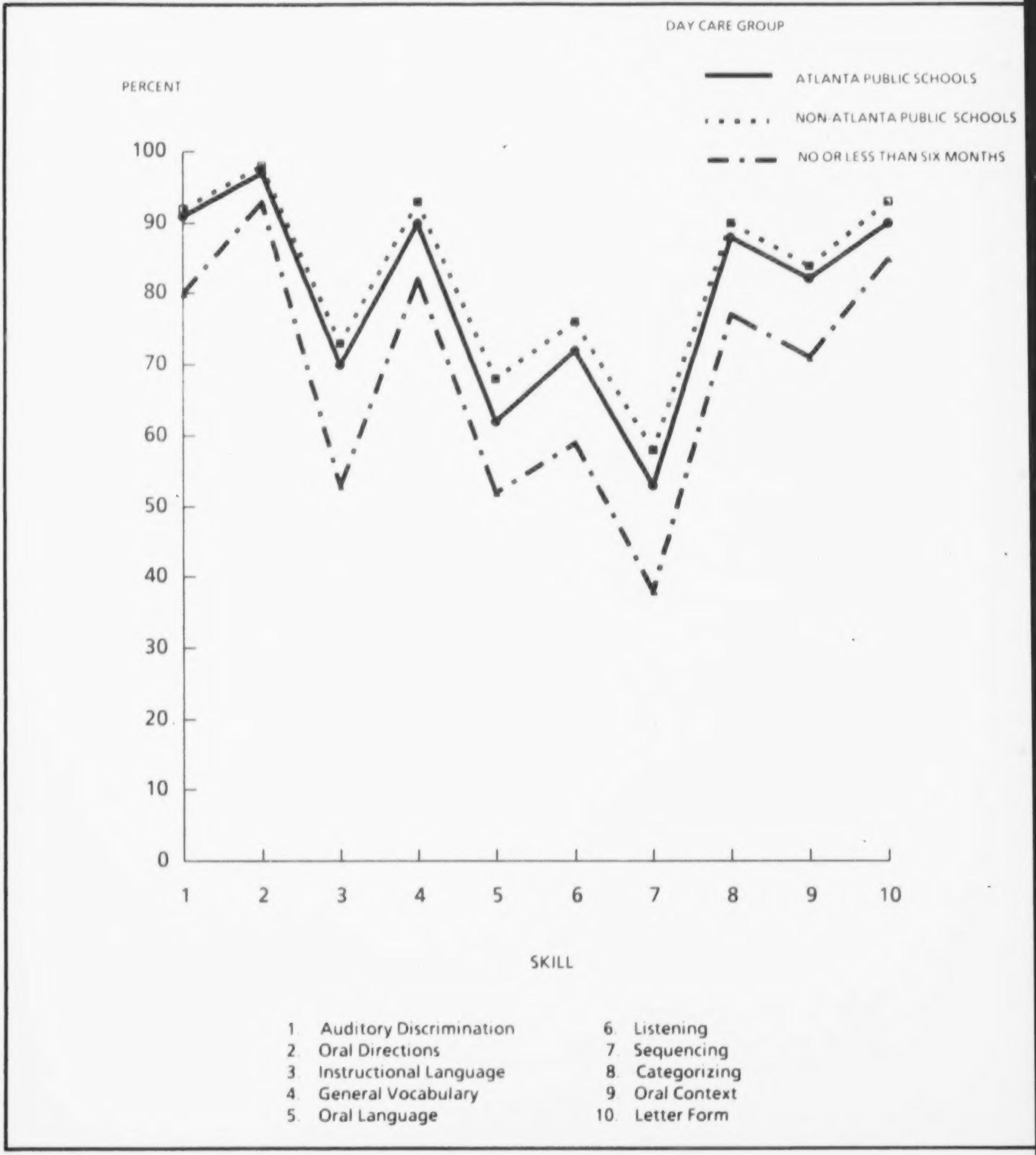
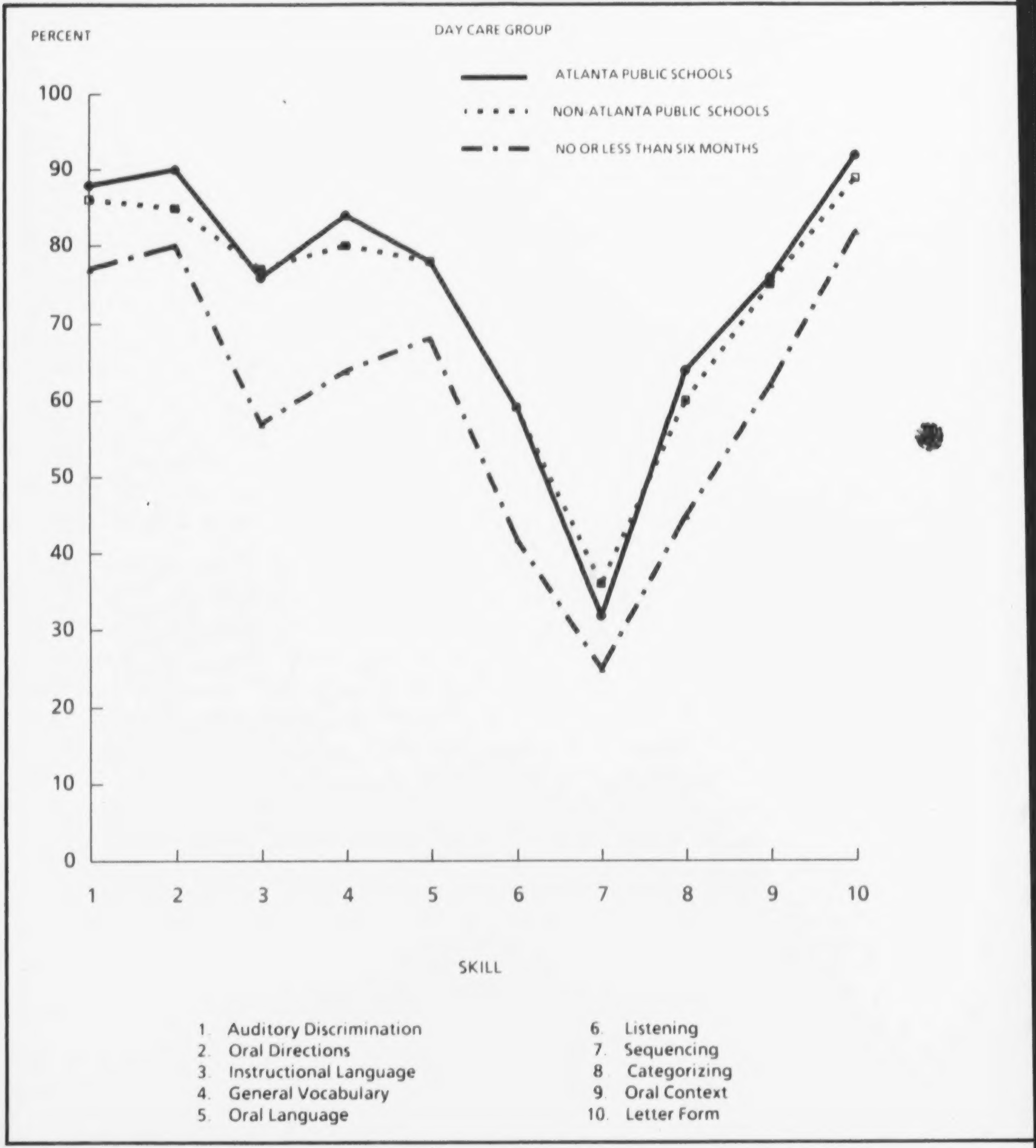


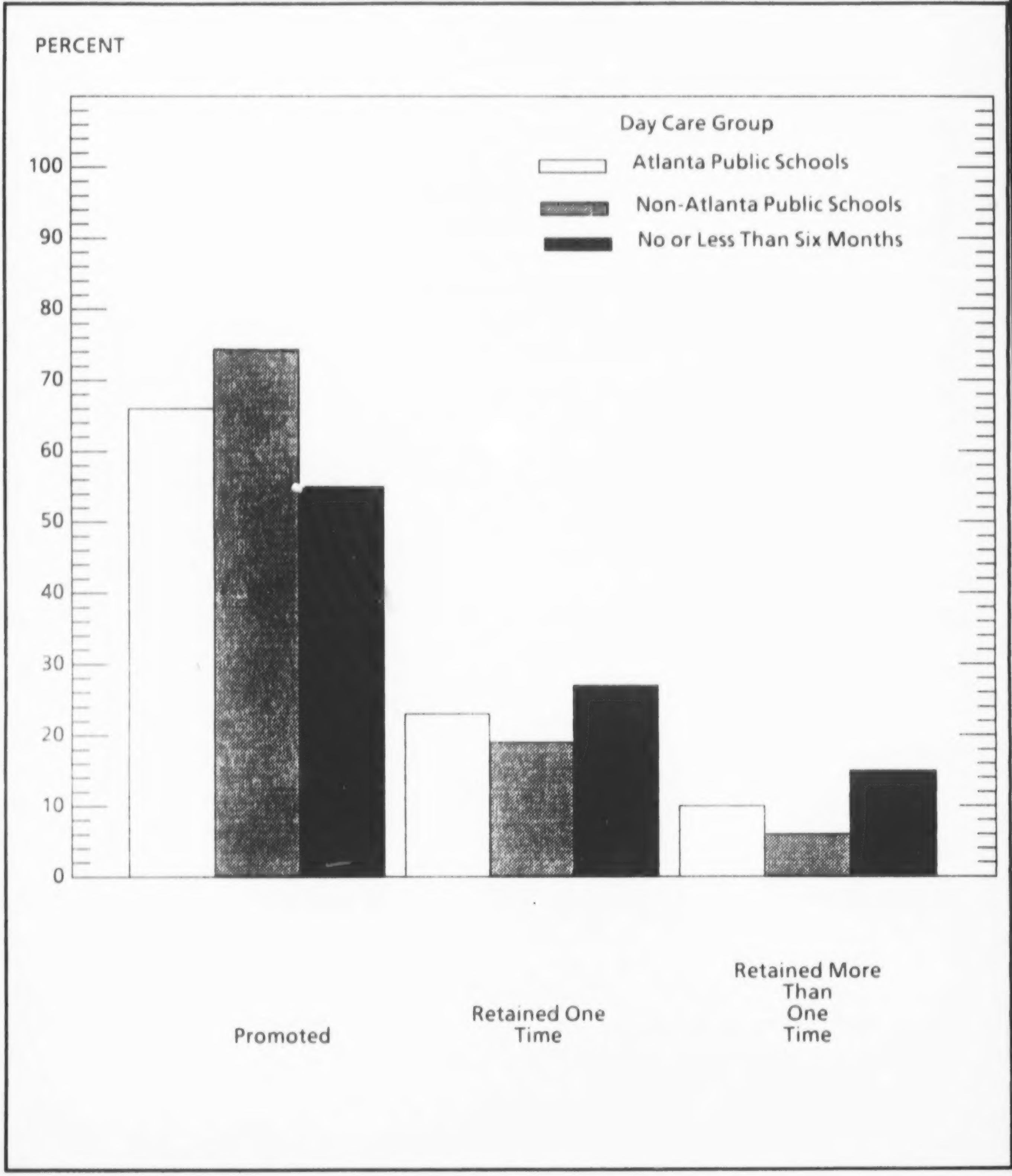
Figure 2. TEST FOR READY STEPS - PERCENT OF KINDERGARTEN STUDENTS MASTERING SKILLS BY DAY CARE GROUP, FALL 1981



An examination of promotion and retention for the 3,246 students who remained in the school system from 1980-81 to 1986-87 (Figure 3) showed that the highest rate of grade-level retention occurred for students who had no formal day care or less than six months of day care prior to entering school. A greater proportion of the students in the no-day-care group were retained one or more times over the seven-year period, when compared to the other groups.

The percentage of students promoted each year over the seven-year period was highest for the non-Atlanta Public Schools day care group. The rate of promotion for Atlanta Public Schools day care students was 6 points lower than the rate for the non-Atlanta Public Schools day care group, but was 11 points higher than the percentage of students promoted in the no-day-care group.

Figure 3. THE 1980-81 KINDERGARTEN CLASS
PROMOTION AND RETENTION FOR STUDENTS WHO ATTENDED ATLANTA PUBLIC SCHOOLS
FROM 1980-81 TO 1986-87



The compensatory education program provided participating students with supplementary education services in reading and mathematics beyond the regular classroom. Based on the priority of need from available student data, multiple selection criteria were established for program concentration at certain grade levels. The selection criteria included grade retention, norm-referenced and criterion-referenced tests data, student performance on various grade-level indicators, and teacher recommendation.

Regular and compensatory teachers developed an individualized instructional plan to guide the cooperative implementation of the instruction which was geared to meet the special needs of the participating students.

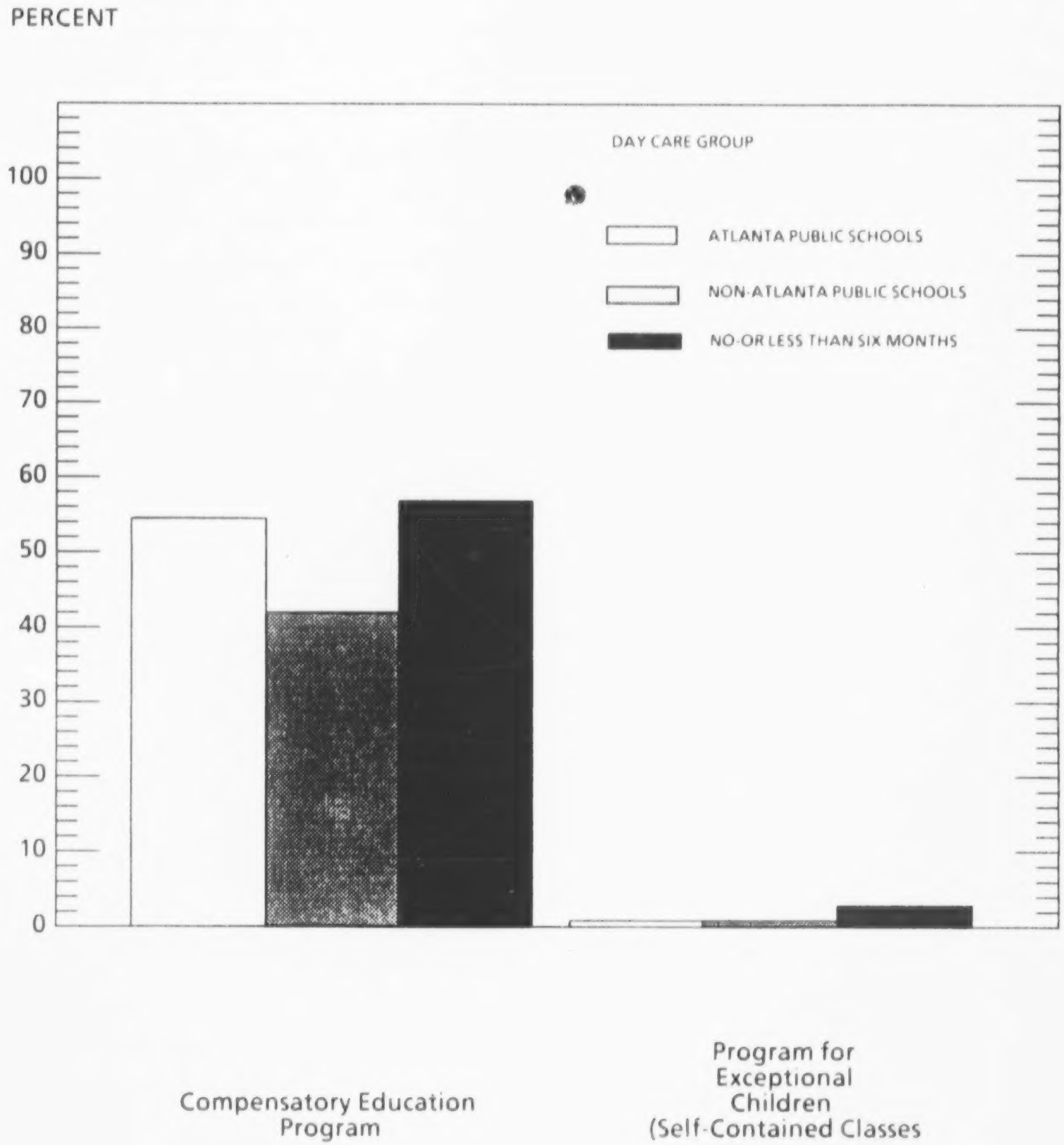
The Program for Exceptional Children provided appropriate educational opportunities to the eligible children and youth including those exceptional children whose school achievement or adjustment was hindered due to emotional, physical, communicative or intellectual deviations, or a combination of these needs.

Figure 4 provided the comparative data for the three groups for students in the compensatory education program and the Program for Exceptional Children (self-contained classes). Over the seven-year period from 1980-81 to 1986-87, the largest percentage of students selected for participation in the compensatory education program entered kindergarten in 1980-81 with no or less than six months of formal day care experience. The percentage of these students was 6 points higher than the rate for the Atlanta Public Schools day care group and 13 percentage points higher than the rate of selection for the non-Atlanta Public Schools day care group. The comparison between the two day care groups showed a difference of 7 percent more students from the Atlanta Public Schools day care group than from the non-Atlanta Public Schools day care group (Appendix E).

The available data for self-contained classroom settings for the Program for Exceptional Children showed an equal proportion of students from the two day care groups, while the no-day care group had a slightly higher proportion of students in the self-contained special education classes over the seven-year period.

A slightly greater proprotion of students with no day care were selected to participate in the compensatory education program when compared to students in

Figure 4. THE 1980-81 KINDERGARTEN CLASS
STUDENTS IN COMPENSATORY EDUCATION AND PROGRAM FOR EXCEPTIONAL CHILDREN
FOR ONE OR MORE YEARS FROM 1980-81 TO 1986-87



the two day care groups. The needs of the students selected as participants in the compensatory education program were quite similar and less identifiable by day care experience (Figures 5 and 6). More than one-half of the students in need of compensatory education services for reading and/or mathematics were identified at grades 2 and 3. The pattern of selection for the Atlanta Public Schools day care group showed that the need for compensatory education was identified for most students at grades 2 and 3. However, for students who were promoted each year from 1980-81 to 1986-87, the need for compensatory education services was evidenced again at grade 6 where 19 percent of the group was selected for the program for the first time.

About one-half of the compensatory education participants in each of the three groups received program services for one year. A slightly higher percentage of the Atlanta Public Schools students needed compensatory program services for only two years which lessened the proportion of the group which remained in the compensatory program for more than two years. Students in the compensatory program for more than two years was highest for the no-day-care group (23 percent). The percentage for the non-Atlanta Public Schools day care group was 21 percent, and the Atlanta Public Schools day care group had the lowest percentage (18 percent) of students in the compensatory education program for more than two years.

Figure 5. THE 1980-81 KINDERGARTEN CLASS - GRADE AT FIRST TIME-SELECTION FOR THE COMPENSATORY EDUCATION PROGRAM 1890-81 TO 1986-87

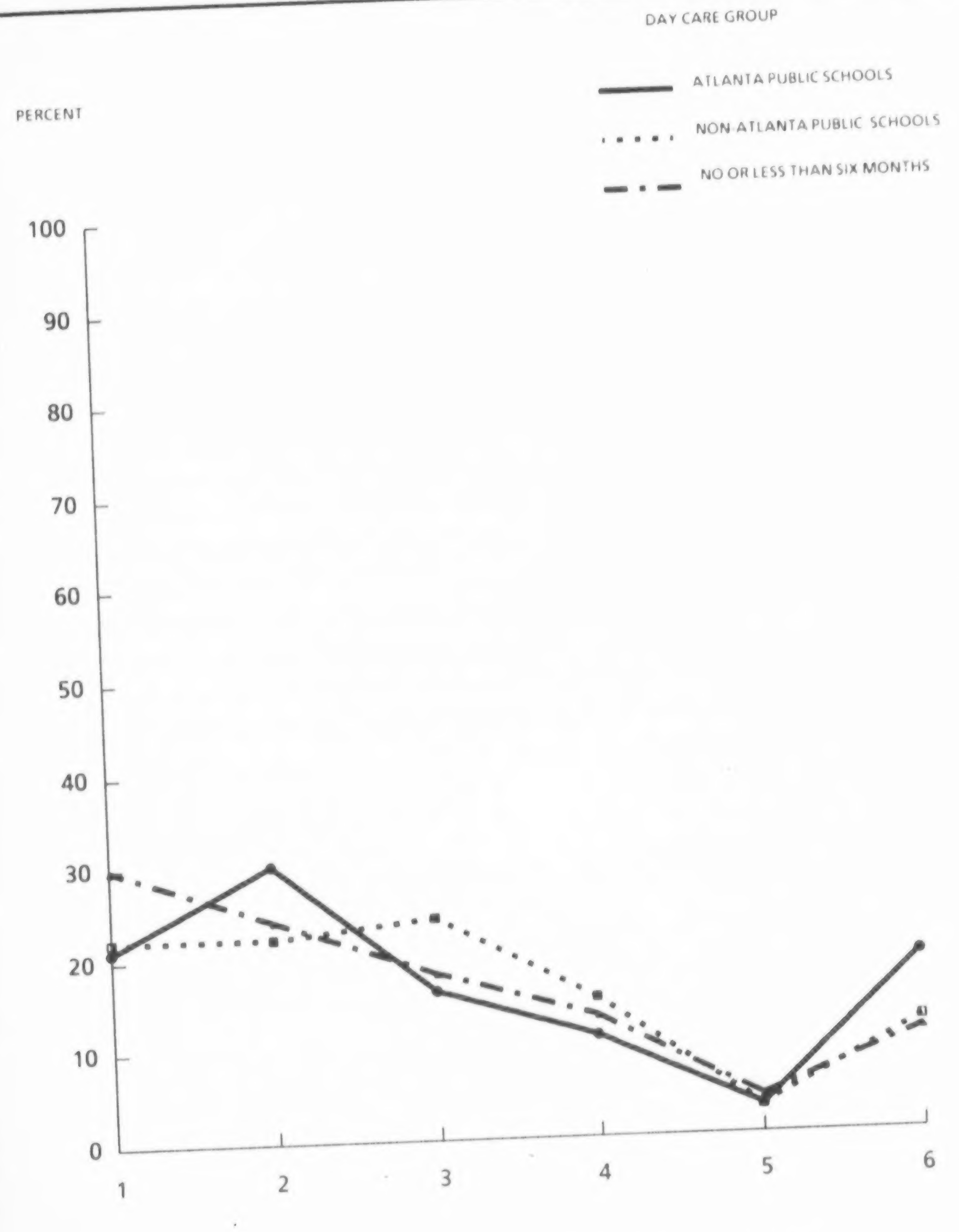
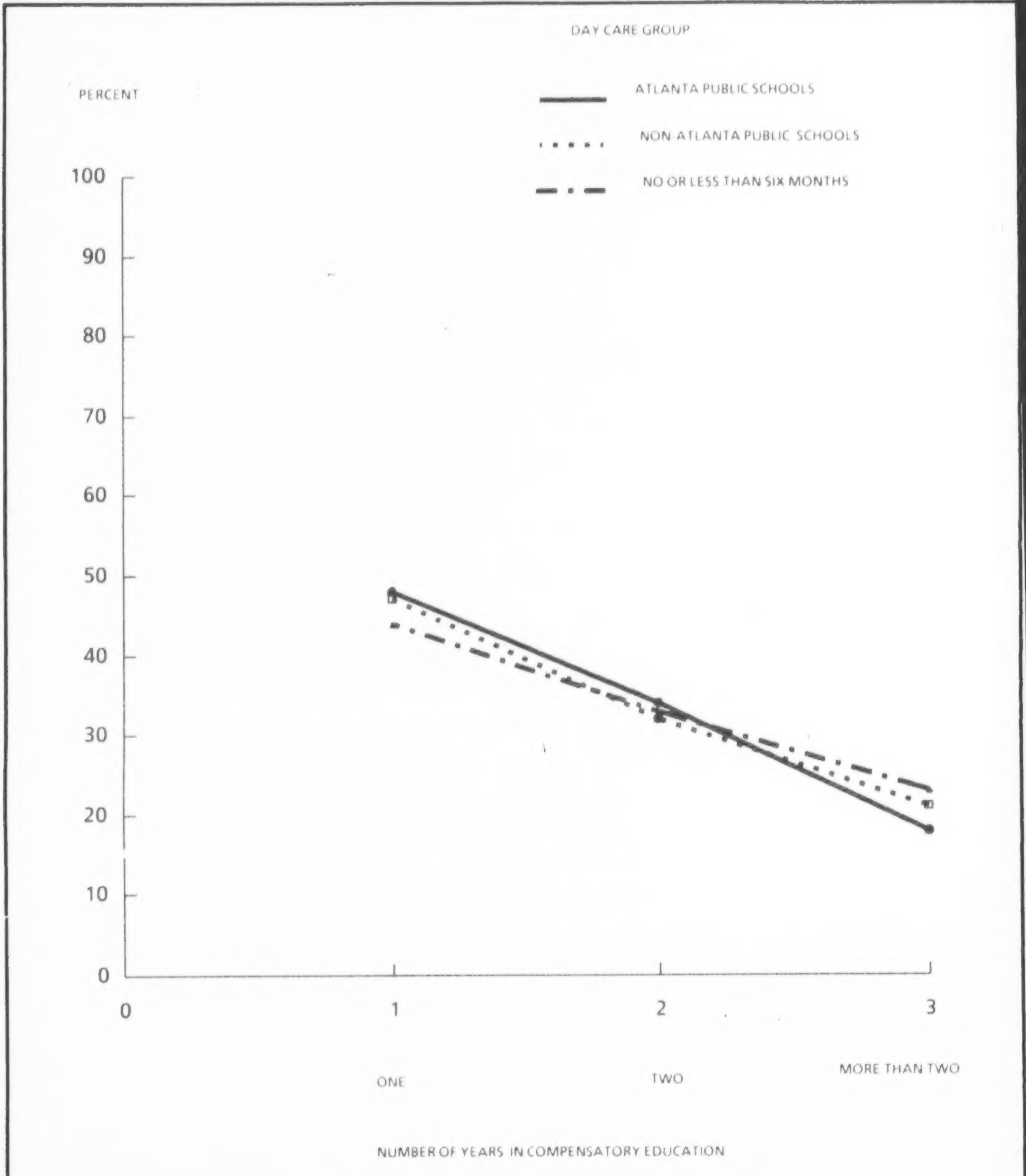


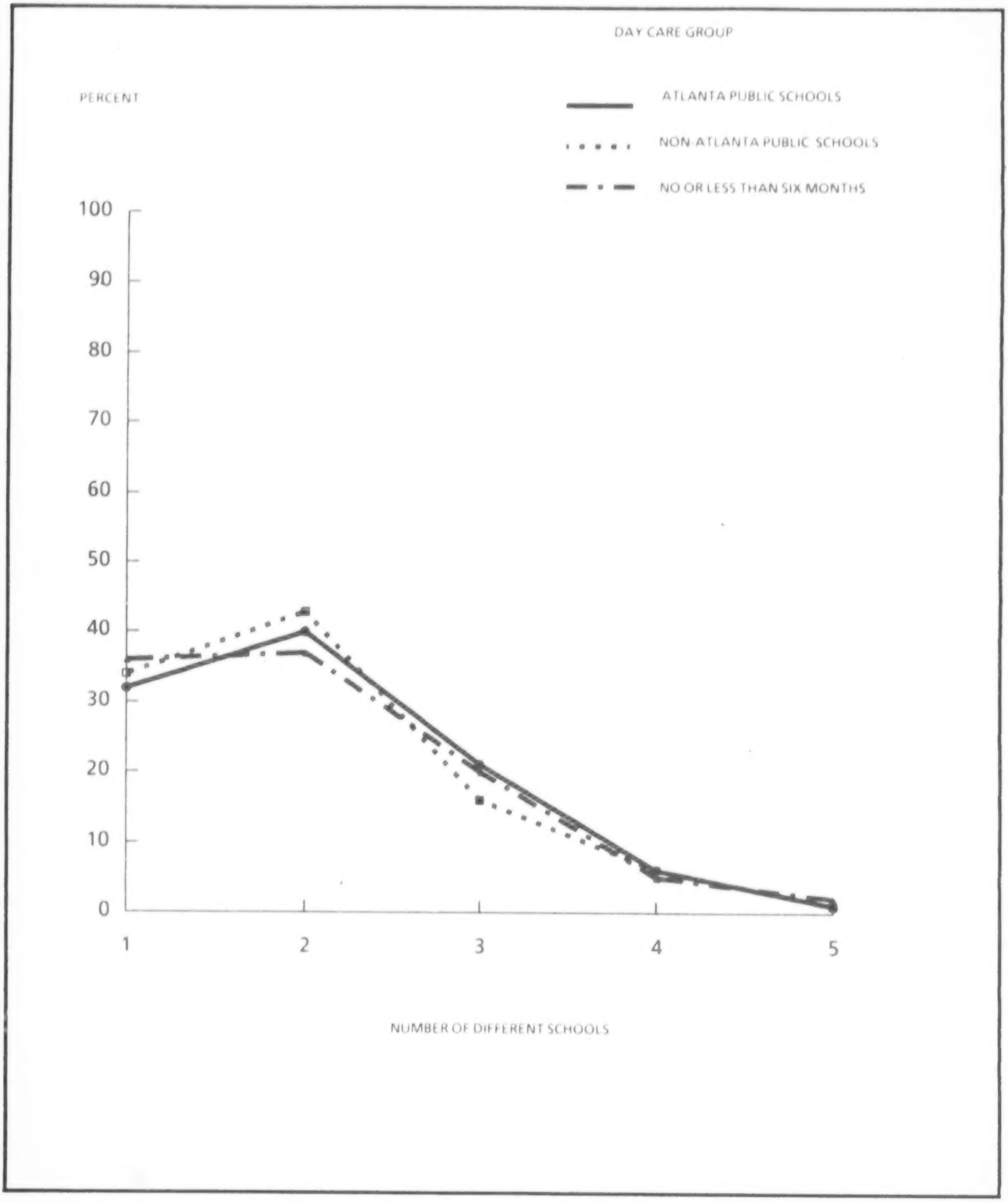
Figure 6. THE 1980-81 KINDERGARTEN CLASS NUMBER OF YEARS IN THE COMPENSATORY EDUCATION PROGRAM, 1980-81 TO 1986-87



From kindergarten through sixth grade, most students in each of the day care groups changed school two times (Figure 7). Students in the 1980-81 kindergarten class who were promoted each year were in grade 6 in 1986-87. The grade level organization of the school system necessitated the change of school for students promoted to sixth grade from an elementary school which had kindergarten through fifth grade. Students remaining in the same school for seven years were those attending an elementary school with kindergarten through seventh grade, or students who were retained one or more times.

Twenty-eight percent of the Atlanta Public Schools day care students changed schools three or more times as compared to 23 percent for the non-Atlanta Public Schools day care students and 27 percent for the no-day-care students (Appendix F).

Figure 7. THE 1980-81 KINDERGARTEN CLASS
STUDENT TRANSFERS TO DIFFERENT SCHOOLS FROM 1980-81 TO 1986-87



The unit of analysis for the data in Table 29 was the eight waves of Atlanta Public Schools day care students who entered kindergarten in 1972-73 to 1979-80. Beginning with 1980-81 and tracking the students to 1986-87 revealed that approximately 53 percent of the total group remained stable in school enrollment from 1980-81 to 1986-87.

For 964 (47 percent) of the students, 553 transferred to new schools, 114 withdrew from school prior to graduation, and 297 students graduated from high school.

The socioeconomic indices which influenced school transfers and withdrawals from school prior to graduation were discerned from the reasons given for student transfers and withdrawals.

Residential mobility for the Atlanta Public Schools day care students and total system students (1986-87) indicated relocation primarily within the Atlanta area, and secondarily to other parts of Georgia. A small percentage of students transferred to public schools outside of Georgia.

School withdrawals prior to graduation were for a variety of reasons which included medical, court action, marriage, pregnancy, nonattendance, lack of interest in school, and going to work. The greatest proportion of the students were withdrawn from school because of nonattendance, pregnancy and going to work. Lack of interest in school was the reason for the second largest group of students to withdraw from school. Other students indicated the reason for leaving school as medical, marriage and action of the courts.

The sample of 297 former Atlanta Public Schools day care participants identified as high school graduates were in the classes of 1984-85, 1985-86 and 1986-87.

TABLE 28

REASON FOR TRANSFERS AND WITHDRAWALS ATLANTA PUBLIC SCHOOLS DAY CARE STUDENTS WHO ENTERED KINDERGARTEN IN 1972-73 TO 1979-80

REASON FOR TRANSFER AND WITHDRAWAL	NUMBER AND PERCENT OF STUDENTS, 1980-81 TO 1986-87		TOTAL SYSTEM 1986-87	
	N	%	N	%
Transferred to				
Another School in Atlanta System	402	72	457	34
Georgia Public Schools	108	20	595	43
Public Schools Outside Georgia	20	04	246	19
Other	23	04	30	02
Total Transferred	553	100	1,328	100
Withdrawal				
Medical	06	05	48	04
Court Action	05	04	15	01
Armed Forces	--	--	3	--
Married	03	03	02	--
Pregnant	24	21	77	06
Nonattendance	60	53	865	69
Lack of Interest	05	04	127	10
To Work	11	10	99	08
Expulsion	--	--	28	02
Total Withdrawals	114	100	1,264	100
High School Graduates	297		3,678	
Total Sample	964		6,270	

SUMMARY OF RESULTS

The research priority for the study was to ascertain facts and establish relationships among the variables for two research questions regarding the educational benefits of the Title IV-A/XX/SSBG comprehensive child day care program for students in the Atlanta Public Schools.

The first research question addressed the level of student performance on specified measures of school achievement in a comparative analysis among three day care groups: students who received services in the Atlanta Public Schools Title IV-A/XX/SSBG comprehensive child day care program (Atlanta Public Schools day care group), students from child care programs other than the Atlanta Public Schools Title IV-A/XX/SSBG comprehensive child day care program (non-Atlanta Public Schools day care group), and students who did not receive services in the Atlanta Public Schools program or other formal day care programs for six months or more (no-day-care group).

Additionally, the level of student performance on specified measures of achievement for the day care groups was compared with the mean level of performance for the total students constituting the norm or the reference groups. The norm group was the total grade level and the reference groups were the sub-groups in which students had membership, such as the Compensatory Education Program, students promoted or students retained one or more times.

The measure of achievement for the first research question was the Total Reading and Total Mathematics normal curve equivalent (NCE) scores on the California Achievement Tests. The period from 1980-81 to 1984-85 was used as an achievement reference point for all sample groups, as the same edition of the California Achievement Tests was administered to students in grades kindergarten through 12 during this five-year period.

The Total Reading and Total Mathematics NCE scores on the California Achievement Tests from 1980-81 to 1984-85 were analyzed for three independent samples of students who received services in the Atlanta Public Schools day care program, and students in the day care comparison groups (Tables 2 and 3). A five year achievement comparison for one kindergarten group consisted of a sample of 3,383 students who attended the Atlanta Public Schools for five consecutive years from 1980-81 to 1984-85. A one-year achievement comparison for six kindergarten groups consisted of a sample of 29,943 students in the kindergarten classes from 1981-82 to 1986-87. Achievement analysis for eight waves of Atlanta Public Schools day care students was made of a sample of 1,439 students who entered kindergarten from 1972-73 to 1979-80. Results are presented for each of the three sample groups.

Five-Year Achievement for One Kindergarten Group

From the original sample of 4,759 students, 3,383 (71 percent) remained in the school system from 1980-81 to 1984-85. The achievement for this matched group of 3,383 students was analyzed for students promoted each year from kindergarten through fourth grade, students retained one time over the five-year period, and students retained more than one time over the five-year period.

The following results were obtained for the students promoted each year from 1980-81 to 1984-85.

- The observed mean NCE scores for each of the groups in Table 5 showed that the highest level of reading achievement occurred at kindergarten and that mean performance decreased each subsequent year for grades 1 through 4.

- For each grade level from 1980-81 to 1984-85, the observed mean reading achievement was highest for the non-Atlanta Public Schools day care group, and the Atlanta Public Schools day care group earned higher mean reading achievement scores than the no-day-care group.

- The analysis of variance to measure the difference among the mean NCE reading scores for the three groups showed a statistical difference at the .01 level of significance for each year from 1980-81 to 1984-85 .

- The multiple comparisons of group mean NCE scores for reading showed a significant difference in favor of the Atlanta Public Schools day care group when compared to the no-day-care group at kindergarten, grade 2 and grade-3.

- At kindergarten, the performances of the Atlanta Public Schools and the non-Atlanta Public Schools day care groups were comparable. Also, both day care groups scored significantly higher than the no-day-care group.

- At grades 1 and 4, the impact of day care was greatest for the non-Atlanta Public Schools day care group, as reading achievement was higher than the level for the Atlanta Public Schools and the no-day-care groups.

- Overall, there was a significant difference in reading achievement in favor of day care when compared to no day care. Both day care groups earned higher reading achievement scores than the no-day-care group at grades kindergarten, 2, and 3.

- The multiple comparisons of group achievement gains over the five-year period showed a negative gain, as the reading NCE score decreased each year for each day care group.

- For mathematics, the level of achievement was comparable between the Atlanta Public Schools and the non-Atlanta Public schools day care group for kindergarten through third grade. The difference in the mathematics achievement between the two day care groups was nonsignificant kindergarten through third grade.

- The multiple comparisons of group mathematics achievement gains each year showed no difference between the three groups from kindergarten through third grade. At grade 4, mathematics achievement gain was significant in favor of the non-Atlanta Public Schools day care group when compared to the no-day-care group.

The following results were obtained for students retained one or more times from 1980-81 to 1984-85.

- The reading and mathematics achievement for the 805 (24 percent) students who were retained one time during the five-year period showed a significant difference among the three groups for reading only, and the achievement difference occurred at kindergarten and first grade .

- The Atlanta Public Schools day care students who were retained one time scored significantly higher for reading than the no-day-care group at kindergarten and first grade. The multiple comparisons among day care groups for the other grades were nonsignificant for mean reading and mathematics achievement each year as well as for achievement gains from year to year.

- The reading and mathematics achievement for the 163 (5 percent) students who were retained more than one time from 1980-81 to 1984-85 showed an impact for day care only at the third year of school when students were retained in grades 1 and 2. Significant reading gains were realized by the Atlanta Public Schools and the no-day-care groups for reading and for each of three groups for mathematics. Other group comparisons were nonsignificant.

The following overall results were obtained from the 1980-81 kindergarten students who attended the Atlanta Public Schools from 1980-81 to 1984-85.

- The impact of day care experience was most noticeable at kindergarten, as achievement differences were significant in the contrast of day care groups with the no-day-care group. The difference in reading and mathematics achievement between the Atlanta Public Schools day care group and the non-Atlanta Public Schools day care group was nonsignificant at kindergarten for students who were not retained as well as for those who were retained one or more times.

- For students who were promoted from kindergarten through fourth grade, achievement during first grade was highest for the non-Atlanta Public Schools day care group. Beyond first grade, the impact of day care experience was noticeable for both the Atlanta Public Schools and non-Atlanta Public Schools day care groups for reading achievement at second and third grades. For mathematics, achievement was highest for the non-Atlanta Public Schools day care group only in contrast to the no-day-care group in kindergarten through third grade. The mathematics achievement at fourth grade for the non-Atlanta Public Schools group was significantly higher than the level for the Atlanta Public Schools and the no-day-care groups.

- The Atlanta Public Schools day care group derived greater achievement outcomes at kindergarten and made a significant amount of gain in reading and mathematics at first and second grade for students retained one or more times during the five-year period.

One-year Achievement Comparisons for Six Kindergarten Groups

The one-year achievement comparisons among the three groups for six independent kindergarten classes from 1981-82 to 1986-87 yielded findings which were parallel to the results obtained for the five-year comparison of the 1980-81 kindergarten class.

- The multiple comparisons of group reading and mathematics mean NCE scores showed significant difference in achievement in favor of the two day care groups when compared to no-day-care for each of the six kindergarten classes from 1981-82 to 1986-87.

- The comparison between the two day care groups showed a significant difference for reading in favor of the non-Atlanta Public Schools day care group. For mathematics, the achievement was comparable, as the comparison between the level of mathematics achievement for the Atlanta Public Schools day care group and the non-Atlanta Public Schools day care group was nonsignificant for four of the six kindergarten classes from 1981-82 to 1986-87.

Achievement for Eight Waves of Atlanta Public Schools Day Care Students

For the 1,439 students in the eight waves of Atlanta Public Schools day care students who entered kindergarten from 1972-73 to 1979-80, the analysis examined the average group performance that was at or above the national norm level, calculated the achievement gains for each group across the five-year period from 1980-81 to 1984-85, and made a comparison of the mean performance of the day care students with the mean performance for system students at the same grade level. From 1980-81 to 1984-85, students in the sample were in grades 1 through 12.

The following results were obtained.

- A mean NCE score of 50 was used to indicate the national norm level. Scores were higher for mathematics than reading, and students in grades 1 through 5 earned reading and mathematics mean NCE scores at or above the national norm.

- Achievement was highest at grades 1 through 3, remained at or above the national norm through grade 5, and generally was below the national norm in grades 6 through 12. The noticeable decline in group mean achievement occurred at grades 6 and 9, particularly for reading. Mathematics achievement was maintained at a fairly consistent level through grade 7, showed a decline at grade 8, and leveled at a uniform performance pattern through the high school grades.

- While the elementary grades maintained a high level of reading and mathematics achievement, the middle and high school grades showed an overall gain in achievement over the five-year period when the mean NCE score in 1984-85 was compared to the mean NCE score in 1981-82.

- The comparison of the mean reading achievement of the Atlanta Public Schools day care students with the mean reading achievement of system students in the same grade showed a similar pattern of performance. The achievement was higher for mathematics than reading, was highest at grades 1 through 5, showed a decrease at grade 6, and was generally lowest at the high school grade levels.

- The mean reading and mathematics achievement remained similar between the Atlanta Public Schools day care students and system students from grades 1 through 5. Beyond grade 6, achievement lessened for both groups, but the system students maintained a higher level of achievement in grades 6 through 12 than the Atlanta Public Schools day care students.

Variables Not Fully Dependent Upon Achievement Test Scores.

The variables in this section included preassessment at kindergarten entry, patterns of promotion and retention, selection for compensatory education, placement in the Program for Exceptional Children, trends of mobility and stability in school attendance, and the socioeconomic indices which influenced student transfers and withdrawals from school prior to graduation. The schools' holding power was examined as it influenced the proportion of Atlanta Public Schools day care students who remained in the school system and constituted the high school graduation classes.

The unit of analysis was the 1980-81 kindergarten students who attended the Atlanta Public Schools from 1980-81 to 1986-87. For the high school variables related to "school leavers" and graduates, the unit of analysis was the sample of Atlanta Public Schools day care students who constituted the eight waves of students who entered kindergarten from 1972-73 to 1979-80.

The following results were obtained.

- The greatest proportion of students who remained in the Atlanta Public Schools from 1980-81 to 1986-87 were in the Atlanta Public schools day care group (74 percent). The greatest student loss over the seven-year period occurred for students in the non-Atlanta Public Schools day care group. Forty-six percent of the withdrawn students were from the non-Atlanta Public Schools day care group. Seventy-one percent of the students in the no-day-care group remained in the Atlanta Public Schools over the seven-year period.

- The trend of performance on the preassessment at kindergarten entry showed that students in each of the three groups had lowest assessment for the same skills: instructional language, oral language development, listening comprehension and sequencing. The pattern of performance was similar between the Atlanta Public Schools and non-Atlanta Public Schools day care students, and both day care groups earned higher mean scores than the no-day-care students.

The peak performance for day care students was for oral directions, general vocabulary, categorizing, and matching letter forms.

- An examination of promotion and retention for the 3,246 students who remained in the school system from 1980-81 to 1986-87 showed the highest rate of grade retention for the no-day-care students. The percentage of students promoted each year over the seven-year period was 6 points higher for the non-Atlanta Public Schools day care students when compared to the Atlanta Public Schools day care students, and was 11 points higher for the Atlanta Public Schools day care group when compared to no-day-care students.

- For compensatory education and placement in the self-contained classes of the Program for Exceptional Children, the largest percentage of students were in the no-day-care group. The percentage of no-day-care students in the compensatory education program was 4 points higher than the rate for Atlanta Public Schools day care students. The participation for Atlanta Public Schools day care students was 11 percentage points higher than the rate for non-Atlanta Public Schools day care students over the five-year period. Three percent of the no-day-care students were in the self-contained classes in the Program for Exceptional Children, as compared to 1 percent of the students in each of the two day care groups.

- Although there was a difference among the three groups in the percentage of students who participated in the compensatory education program, the needs of the students were quite similar and less identifiable by day care groups. About one-half of the eligible students in each day care group were identified at grades 1 and 2. Students generally remained in the program one or two years. No-day-care students had the greatest need for compensatory education for more than two years.

- In contrast to the other groups, the Atlanta Public Schools day care students indicated a need for compensatory education at grades 1 and 2, and again at grade 6 for the students who were promoted each year from 1981-82 to 1986-87. Grade 6 was a transition grade for students promoted to middle school from elementary schools with grades kindergarten through 5.

- Over the seven-year period from 1981-82 to 1986-87, the largest percentage of students in each group (one-third or more) changed schools two times. Much of this student movement was necessitated for students promoted to sixth grade from K-5 elementary schools. Twenty-eight percent of the Atlanta Public Schools students changed schools three or more times, as compared to 23 percent for the non-Atlanta Public Schools day care group and 27 percent for the no-day-care group. Atlanta Public Schools day care students showed geographical mobility which may also have been an indication of improved socioeconomic circumstances, as the students were enrolled in schools throughout the school system.

DISCUSSION AND RECOMMENDATIONS

In a cross-sectional approach which utilized several independent samples, the follow-back strategy identified some of the critical antecedent variables associated with the eduational benefits of the Title IV A/XX/SSBG comprehensive child day care program for students in the Atlanta Public Schools.

This discussion of the results of the study is done in relationship to the norms and expectations for grade-level students, the trends and patterns exemplified for other day care and no-day-care groups, and in view of the question, what might have been the educational outcomes for the students had there not been a Tititle IV-A/XX/SSBG comprehensive child day care program. Recommendations focus on the extent to which the magnitude of the results has implications for program planning and policy, and on how the results may contribute to the planning needs of child care providers and educators for children benefiting from day care as well as the large group of students who are not served by formal preschool intervention programs.

Throughout the operation of preschool programs in the Atlanta Public schools, program evaluations and analysis of data by gross groupings of children with preschool and no preschool experience reaffirmed the importance of preschool experience for the child. The immediate, short-term impact of the preschool intervention programs was recognized.

The results of this research study have significance within the context of the impact of preschool experience on school achievement which was documented in the myriad of program evaluations and in the research literature.

The study made use of day care comparison groups which included a large variety of public and private programs and services offered within the field of child care. The evaluation of the Head Start Program in 1969 raised the issue of whether annual child care cost may be related to program quality and the subsequent benefits derived from child care programs. This study did not address the issue of child care costs or program quality for the various child care programs which made up the day care and no-day-care comparison groups.

The longitudinal evaluation of the Follow Through Program in 1976 addressed the issue of variability in effectiveness among sites implementing the same program model and concluded that program models were adapted to meet the local educational needs. This study did not test for variability in effectiveness among day care sites implementing the same day care model, but considered the collective influence of the day care centers of the Atlanta Public Schools day care program, and the variety of child care programs and services included in the non-Atlanta Public Schools day care group. The analysis compared the effectiveness between the two day care groups and between the day care groups and the no-day-care group.

The results of this study are consistent with the findings of Castro, et al (1983) that a variety of prekindergarten or preschool programs have significant and substantive short-term effects for disadvantaged and minority children as measured by I. Q. scores and achievement on standardized tests.

The results of this study showed the short-term effects of day care when compared to no day care on the reading and mathematics achievement for three independent samples of students in the Atlanta Public Schools. The impact of day care was more consistent for reading achievement than for mathematics, and for kindergarten and the primary grades than for the middle and high school grades. Likewise, Van de Riet and Van de Riet (1969) and Naron (1981) concluded that the developmental level of children from kindergarten through second or third grade remained higher than the no-preschool group, but the difference between the groups decreased to the extent of being statistically nonsignificant by the end of third grade.

Similar to the findings of Archambo (1970), which indicated that the greatest loss in intellectual functioning for former child care project children occurred in the first grade for students with I.Q. scores above 80 and who were retained in the first grade, the results of this study showed that achievement differences were significant for the Atlanta Public Schools day care students at kindergarten, second and third grades, but not for first grade. However, students retained in first or second grade made significant gains in achievement during the two years in the same grade. For the three groups, 20 to 30 percent of the eligible students needed the services of the compensatory education program during first grade. At first grade, the selection criteria for the compensatory education program included students retained in first grade and students considered at risk for successful grade-level performance.

Differential achievement is expected because students experience varying levels of out-of-school support for learning, and parental support and expectations influence student motivation and effort (Hinkley, Beal, et al., 1979). This study did not focus on the influence of the home and other out-of-school support for learning except indirectly in the variables not fully dependent upon achievement test scores. The preassessment at kindergarten entry included skills, such as oral language, which were influenced not only by the day care programs but by the home and out-of-school factors. Residential mobility, changes in schools, and the socioeconomic factors influencing school leavers and high school graduates were other out-of-school factors.

Plisko, et al (1986) stated that the heightened interest in preschool education and the disagreement over its effectiveness have generated the need for information on what education is currently being provided to preschoolers, what outcomes should be expected, and how preprimary programs complement learning in the home. This statement embodies the issues facing child care funding agencies, services providers and educators, and becomes an important recommendation for this study. Only a small number of national surveys collected representative data relevant to the policy issues and concerns about preprimary or preschool education. It becomes significant for local research efforts to undertake the responsibility for responding to local needs for data collection on relevant issues and concerns about child care, welfare and education.

This study addressed the research priority of determining the educational benefits of the day care program for students in the Atlanta Public Schools. A sizeable sample was identified and the results pertained to academic achievement as well as variables not fully dependent upon achievement test scores. The comparative analysis for the three groupings of students in the Atlanta Public Schools day care program, the non-Atlanta Public Schools day care program, and students with no formal day care, yielded a database to serve as the foundation and impetus for the refinement of variables not fully analyzed in this study.

A series of ministudies emanating from this database may further pursue the differential achievement of students within each day care group, particularly the instruction-related factors which influenced the achievement differences in reading when compared to mathematics. Another area for further study locally is the educational outcomes for students through the high school grades, and a follow-up study of high school graduates. It would be beneficial to examine the impact of the Georgia Quality Basic Education Act (QBE) on students who are taught the basic curriculum content and are assessed through the state-mandated tests. Further analysis may include a comparison of the federal or state subsidized day care programs with the variety of private, parochial, corporate and non-subsidized child care programs which make up the non-Atlanta Public Schools day care group.

Educational and social research may not bring simplity to the complex issues related to the care, welfare and education of children. For these and others results, the decision is what course of action is warranted. The educational benefits of the Atlanta Public Schools Title IV-A/XX/SSBG for students in the Atlanta Public Schools have been realized for more than two decades, as one need only to consider what might have been the educational outcomes for the students in the absence of the program. The existence of the large group of students without the benefit of formal preschool intervention provides a charge to service providers and early childhood educators to consider the anticipated benefits to be derived for many children if more accessible, affordable programs were provided.

The recommendations for the local school system is to maintain continued contract relations with the current funding source for the day care program. With the supplemental support which the local school system may identify, the Atlanta Public Schools day care program may be expanded to other school communities with documented need, and augmented to accommodate children who may not be eligible under the guidelines for the operation of the current day care program. The feasible service-delivery models may include local school-level parent-child centers and outreach home instruction aimed at reaching the four-year-olds during the year preceding eligibility for enrollment in public kindergarten.

SUPPLEMENTAL REPORT

ACHIEVEMENT FOR STUDENTS IN 22 SCHOOLS WITH TITLE IV-A/XX/SSBG DAY CARE PROGRAMS

This supplemental report provides an analysis of reading and mathematics achievement by day care experience, for students in 22 of the current 23 Atlanta Public Schools that operate Title IV-A/XX/SSBG day care programs.

The study used the mean normal curve equivalent score (NCE) for Total Reading and Total Mathematics, on the California Achievement Tests for school years 1980-81, '82, '84 and '85. Data for school year 1982-83 were omitted because of a technical problem with the data file. The school years 1980-81 to 1984-85 were used because the California Achievement Tests was administered to students in all grade levels during this five-year period and the tests provided a uniform measure of achievement.

Students who entered school in the four kindergarten classes were placed by previous day care experience, into three comparison groups: Atlanta Public Schools day care, non-Atlanta Public Schools day care, and no-day-care. The measure of achievement and the comparison groups are the same as that used for the analysis in the main report for students in the system.

The descriptive statistics, for the sample of students in the four kindergarten classes at the 22 schools from 1980-81 to 1984-85, are presented in Table 1. Of the original sample, reading and mathematics achievement test scores were obtained for approximately 96 percent of the students. Reading and mathematics achievement were analyzed for the kindergarten grade and for each subsequent grade attained through 1984-85. That is, for 1980-81, analysis was made for kindergarten through fourth grade; for 1981-82, kindergarten through third grade; for 1983-84, kindergarten through first grade; and for kindergarten only in 1984-85.

Reading achievement is presented in Tables 2 through 5, and mathematics achievement is presented in Tables 6 through 9. The mean NCE scores indicated a higher level of achievement for mathematics than for reading, and the differences among the three comparison groups were more noticeable for reading than for

TABLE 1

DESCRIPTION OF THE SAMPLE

Student who Attended Atlanta Public Schools in the Kindergarten Classes of 1980-81 to 1984-85

Day Care Experience	Original Sample 1980-81 to 1984-85		Study Sample 1980-81 to 1984-85	
	N	%	N	%
Atlanta Public Schools (APS	2,104	36	2,054	37
Non-Atlanta Public School (Non-APS)	1,522	26	1,472	26
No or Less than Six Months (No-DC)	2,182	38	2,059	37
Total	5,808	100	5,585	100

mathematics. That is, the analysis of variance showed a statistically significant difference in reading achievement among the three comparison groups for each grade level.

Differences in reading and mathematics achievement among the three comparison groups occurred repeatedly at kindergarten and first grade, and the differences were in favor of the day care groups when compared to the no-day-care group. There was a significant difference in favor of the Atlanta Public Schools day care students when compared to students who had no day care experience. There was a significant difference in favor of the non-Atlanta Public Schools day care students when compared to students who had no day care experience.

The comparison of reading and mathematics achievement between the Atlanta Public Schools day care students and the non-Atlanta Public Schools day care students indicated, generally, a similar level of performance. There was no significant difference in reading achievement between the groups at kindergarten and first grade, but there were two occurrences in which the Atlanta Public Schools day care students had significantly higher test scores for mathematics than that for the non-Atlanta Public Schools day care students. These were for mathematics in first grade in 1983, and for mathematics in kindergarten in 1985. The one occurrence in which the non-Atlanta Public Schools day care students had significantly higher test scores than the Atlanta Public Schools day care students, was for second grade in 1983.

The analysis of the performance of each group of kindergarten students, as they progressed through the subsequent grade levels between 1980-81 and 1984-85, showed the following results:

- For the students who entered kindergarten in 1980-81, differences in reading achievement were in favor of the day care groups, when compared to students who had no day care, for kindergarten through fourth grade. Differences in mathematics achievement were in favor of the day care groups when compared to students who had no day care experience, for kindergarten and first grade. There were no significant differences in the mathematics test scores among the day care and the no-day-care groups, for grades 2, 3, and 4.

- For the students who entered kindergarten in 1981-82, differences in reading achievement were in favor of the day care groups when compared to students who had no day care, for kindergarten through third grade. Differences in mathematics achievement were in favor of the day care groups when compared to students who had no day care experience for kindergarten and third grade. At first grade, the Atlanta Public Schools day care students had significantly higher mathematics achievement than students in the non-Atlanta Public Schools day care group and students in the no-day-care group. There were no significant differences among the groups for second grade.

- For the students who entered kindergarten in 1983-84, differences in reading and mathematics achievement were in favor of the day care groups when compared to students who had no day care experience, for kindergarten and first grade. There were no significant differences in reading and mathematics achievement between the Atlanta Public Schools day care and the non-Atlanta Public School day care groups.

- For students who entered kindergarten in 1984-85, differences in reading achievement for kindergarten were in favor of the day care students when compared to students who had no day care experience. For mathematics, both day care groups had higher test scores than the no-day-care group, and the Atlanta Public Schools day care students scored significantly higher for kindergarten than students in the non-Atlanta Public Schools day care group.

The results obtained from the analysis of reading and mathematics achievement in 22 schools with Title IV-A/XX/SSBG day care programs were similar to that provided in the main report for students in the system. Mathematics achievement, generally, was higher than that for reading. The reading achievement differences were in favor of students with day care experience when compared to students who did not have day care experience. The levels of achievement between Atlanta Public Schools day care students and the non-Atlanta Public Schools day care students were more comparable in the 22 schools with day care programs, when compared to that for schools throughout the system. One difference in results from that obtained in the main report for students in the system, was that students in the

Atlanta Public Schools day care program generally scored equally as well, or significantly higher on achievement tests than students in the non-Atlanta Public Schools day care programs.

TABLE 2

READING ACHIEVEMENT BY DAY CARE EXPERIENCE FOR STUDENTS IN THE KINDERGARTEN CLASS OF 1980-81

22 SCHOOLS WITH DAY CARE PROGRAMS

DAY CARE EXPERIENCE	N	CALIFORNIA ACHIEVEMENT TESTS TOTAL READING MEAN NCE SCORE				
		KDG. 1981	GRADE 1 1982	GRADE 2 1983	GRADE 3 1984	GRADE 4 1985
Atlanta Public Schools (APS)	535	62.37	59.82	55.44	58.28	52.92
Non-Atlanta Public Schools (Non-APS)	319	62.54	61.95	58.55	58.66	54.22
No or Less than Six Months (No-DC)	374	54.72	54.69	52.43	55.56	50.67
Total	1,228	60.08	58.76	55.27	57.76	52.52

SUMMARY ANALYSIS OF VARIANCE, READING MEAN NCE SCORES, TABLE 2

GRADE AND YEAR		D. F.	F RATIO	F PROBABILITY	LEVEL OF SIGNIFICANCE
Kindergarten,	1981	(2) (1225)	15.1688	.0000	.01
Grade 1,	1982	(2) (1123)	12.5416	.0000	.01
Grade 2,	1983	(2) (1069)	7.9099	.0000	01
Grade 3,	1984	(2) (1025)	3.1292	.0442	.05
Grade 4,	1985	(2) (994)	3.5612	.0288	.05

MULTIPLE COMPARISONS OF GROUP READING MEAN NCE SCORES, TABLE 2

DAY CARE YEAR GROUP	NCE MEAN DIFFERENCE	T VALUE	T PROBABILITY	LEVEL OF SIGNIFICANCE
KINDERGARTEN, 1981 APS VS Non-APS	-0.17	-0.108	0.914	NS
APS vs. No-DC	7.65	5.024	0.000	.01
Non-APS vs No-DC	7.83	4.543	0.000	.01
GRADE 1, 1982 APS vs Non-APS	-2.13	1.485	0.138	NS
APS vs No-DC	5.13	3.835	0.000	.01
Non-APS Vs No-Dc	7.26	4.728	0.000	.01
GRADE 2, 1983 APS vs Non-APS	-3.11	-2.151	0.032	.05
APS vs No-DC	3.01	2.229	0.026	.05
Non-APS vs No-DC	6.12	3.969	0.000	.01
GRADE 3, 1984 APS vs Non-APS	-0.38	-0.282	0.778	NS
APS vs No-DC	2.72	2.191	0.029	.05
Non-APS vs No-DC	3.10	2.147	0.032	.05
GRADE 4, 1985 APS vs Non-APS	-1.30	-1.006	0.315	NS
APS vs No-DC	2.25	1.893	0.059	.05
Non-APS vs No-Dc	3.55	2.576	0.010	.01

TABLE 3

READING ACHIEVEMENT BY DAY EXPERIENCE FOR STUDENTS IN THE KINDERGARTEN CLASS OF 1981-82

22 SCHOOLS WITH DAY CARE PROGRAMS

DAY CARE EXPERIENCE	N	CALIFORNIA ACHIEVEMENT TESTS TOTAL READING MEAN NCE SCORE			
		KDG. 1982	GRADE 1 1983	GRADE 2 1984	GRADE 3 1985
Atlanta Public Schools (APS)	504	65.17	60.16	58.53	54.02
Non-Atlanta Public Schools (Non-APS)	359	63.48	58.32	59.51	54.39
No or Less than Six Months (No-DC)	426	52.93	52.62	55.56	51.09
Total	1,289	60.65	57.13	57.76	53.11

SUMMARY ANALYSIS OF VARIANCE, READING MEAN NCE SCORES, TABLE 3

GRADE AND YEAR		D. F.	F RATIO	F PROBABILITY	LEVEL OF SIGNIFICANCE
Kindergarten,	1982	(2) (1286)	35.9254	.0000	.01
Grade 1,	1983	(2) (1188)	16.7248	.0000	.01
Grade 2,	1984	(2) 1124)	4.2143	.0150	.05
Grade 3,	1985	(2) (1069)	3.7669	.0234	.05

MULTIPLE COMPARISONS OF GROUP READING MEAN NCE SCORES, TABLE 3

DAY CARE YEAR GROUP	NCE MEAN DIFFERENCE	T VALUE	T PROBABILITY	LEVEL OF SIGNIFICANCE
KINDERGARTEN, 1982 APS VS Non-APS	1.69	1.059	0.290	NS
APS vs. No-DC	12.24	8.029	0.000	.01
Non-APS vs No-DC	10.54	6.354	0.000	.01
GRADE 1, 1983 APS vs Non-APS	1.84	1.29	0.199	NS
APS vs No-DC	7.54	5.65	0.000	.01
Non-APS Vs No-Dc	5.70	3.85	0.000	.01
GRADE 2, 1984 APS vs Non-APS	-0.98	-0.682	0.495	NS
APS vs No-DC	2.98	2.236	0.026	.05
Non-APS vs No-DC	3.95	2.697	0.007	.01
GRADE 3, 1985 APS vs Non-APS	-0.37	-0.275	0.784	NS
APS vs No-DC	2.93	2.341	0.019	.05
Non-APS vs No-DC	3.30	2.382	0.017	.05

TABLE 4

READING ACHIEVEMENT BY DAY CARE EXPERIENCE FOR STUDENTS IN THE KINDERGARTEN CLASS OF 1983-84

22 SCHOOLS WITH DAY CARE PROGRAMS

DAY CARE EXPERIENCE	N	CALIFORNIA ACHIEVEMENT TESTS TOTAL READING MEAN NCE SCORE	
		KDG. 1984	GRADE 1 1985
Atlanta Public Schools (APS)	506	69.37	60.79
Non-Atlanta Public Schools (Non-APS)	408	70.83	61.65
No or Less than Six Months (No-DC)	554	60.07	56.38
Total	1,468	66.27	59.36

SUMMARY ANALYSIS OF VARIANCE, READING MEAN NCE SCORES, TABLE 4

GRADE AND YEAR		D. F.	F RATIO	F PROBABILITY	LEVEL OF SIGNIFICANCE
Kindergarten,	1984	(2) (1336)	9.6974	.0001	.01
Grade 1,	1985	(2) (1465)	33.9453	.0000	.01

MULTIPLE COMPARISONS OF GROUP READING MEAN NCE SCORES, TABLE 4

DAY CARE YEAR GROUP	NCE MEAN DIFFERENCE	T VALUE	T PROBABILITY	LEVEL OF SIGNIFICANCE
KINDERGARTEN, 1984 APS VS Non-APS	-1.46	-0.973	0.331	NS
APS vs. No-DC	9.29	6.695	0.000	.01
Non-APS vs No-DC	10.75	7.302	0.000	.01
GRADE 1, 1985 APS vs Non-APS	-0.86	-0.632	0.527	NS
APS vs No-DC	4.41	3.534	0.000	.01
Non-APS Vs No-Dc	5.27	3.936	0.000	.01

TABLE 5

READING ACHIEVEMENT BY DAY CARE EXPERIENCE FOR STUDENTS IN THE KINDERGARTEN CLASS OF 1984-85

22 SCHOOL WITH DAY CARE PROGRAMS

DAY CARE EXPERIENCE	N	CALIFORNIA ACHIEVEMENT TESTS TOTAL READING MEAN NCE SCORE
		KDG. 1985
Atlanta Public Schools (APS)	507	69.29
Non-Atlanta Public Schools (Non-APS)	384	69.64
No or Less than Six Months (No-DC)	695	60.73
Total	1,586	65.63

SUMMARY ANALYSIS OF VARIANCE, READING MEAN NCE SCORES, TABLE 5

GRADE AND YEAR	D. F.	F RATIO	F PROBABILITY	LEVEL OF SIGNIFICANCE
Kindergarten, 1985	(2) (1583)	30.1090	.0000	.01

MULTIPLE COMPARISONS OF GROUP READING MEAN NCE SCORES, TABLE 5

DAY CARE YEAR GROUP	NCE MEAN DIFFERENCE	T VALUE	T PROBABILITY	LEVEL OF SIGNIFICANCE
KINDERGARTEN, 1985				
APS VS Non-APS	-0.35	-0.233	0.816	NS
APS vs. No-DC	8.56	6.605	0.000	.01
Non-APS vs No-DC	8.91	6.314	0.000	.01

TABLE 6

MATHEMATICS ACHIEVEMENT BY DAY CARE EXPERIENCE FOR STUDENTS IN THE KINDERGARTEN CLASS OF 1980-81

22 SCHOOLS WITH DAY CARE PROGRAMS

DAY CARE EXPERIENCE	N	CALIFORNIA ACHIEVEMENT TESTS TOTAL MATHEMATICS MEAN NCE SCORE				
		KDG. 1981	GRADE 1 1982	GRADE 2 1983	GRADE 3 1984	GRADE 4 1985
Atlanta Public Schools (APS)	536	62.35	64.24	51.42	61.89	59.26
Non-Atlanta Public Schools (Non-APS)	318	62.35	66.07	51.08	61.39	59.57
No or Less than Six Months (No-DC)	376	56.69	60.61	48.31	60.01	56.91
Total	1,230	60.62	63.57	50.35	60.93	58.59

SUMMARY ANALYSIS OF VARIANCE, MATHEMATICS MEAN NCE SCORES, TABLE 6

GRADE AND YEAR	D. F.	F RATIO	F PROBABILITY	LEVEL OF SIGNIFICANCE
Kindergarten, 1981	(2) (1227)	7.4699	.0006	.01
Grade 1, 1982	(2) (1120)	5.6030	.0038	.01
Grade 2, 1983	(2) (1271)	1.6625	.1901	NS
Grade 3, 1984	(2) (1025)	1.1509	.3168	NS
Grade 4, 1985	(2) (993)	1.9598	.1414	NS

MULTIPLE COMPARISONS OF GROUP MATHEMATICS MEAN NCE SCORES, TABLE 6

DAY CARE YEAR GROUP	NCE MEAN DIFFERENCE	T VALUE	T PROBABILITY	LEVEL OF SIGNIFICANCE
KINDERGARTEN, 1981 APS VS Non-APS	-0.00	-0.002	0.998	NS
APS vs. No-DC	5.66	3.555	0.000	.01
Non-APS vs No-DC	5.66	3.141	0.002	.01
GRADE 1, 1982 APS vs Non-APS	-1.83	-1.159	0.247	NS
APS vs No-DC	3.63	2.449	0.014	.05
Non-APS Vs No-Dc	5.46	3.215	0.001	.01
GRADE 2, 1983 APS vs Non-APS	0.34	0.181	0.856	NS
APS vs No-DC	3.12	1.734	0.083	NS
Non-APS vs No-DC	2.77	1.368	0.171	NS
GRADE 3, 1984 APS vs Non-APS	0.50	0.367	0.714	NS
APS vs No-DC	1.88	1.501	0.134	NS
Non-APS vs No-DC	1.38	0.945	0.345	NS
GRADE 4, 1985 APS vs Non-APS	-0.31	-0.21	0.833	NS
APS vs No-DC	2.35	1.74	0.083	NS
Non-APS vs No-Dc	2.66	1.69	0.091	NS

TABLE 7

MATHEMATICS ACHIEVEMENT BY DAY CARE EXPERIENCE FOR STUDENTS IN THE KINDERGARTEN CLASS OF 1981-82

22 SCHOOLS WITH DAY CARE PROGRAMS

DAY CARE EXPERIENCE	N	CALIFORNIA ACHIEVEMENT TESTS TOTAL MATHEMATICS MEAN NCE SCORE			
		KDG. 1982	GRADE 1 1983	GRADE 2 1984	GRADE 3 1985
Atlanta Public Schools (APS)	502	65.37	59.62	62.36	59.77
Non-Atlanta Public Schools (Non-APS)	359	63.32	52.63	62.73	59.97
No or Less than Six Months (No-DC)	426	54.51	49.65	60.01	56.89
Total	1,287	61.20	54.34	61.64	58.83

SUMMARY ANALYSIS OF VARIANCE, MATHEMATICS MEAN NCE SCORES, TABLE 7

GRADE AND YEAR		D. F.	F RATIO	F PROBABILITY	LEVEL OF SIGNIFICANCE
Kindergarten,	1982	(2) (1284)	23.6825	.0000	.01
Grade 1,	1983	(2) (1365)	15.0671	.0000	.01
Grade 2,	1984	(2) (1126)	2.1130	.1214	NS
Grade 3,	1985	(2) (1071)	3.2346	.0398	.05

MULTIPLE COMPARISONS OF GROUP MATHEMATICS MEAN NCE SCORES, TABLE 7

DAY CARE YEAR GROUP	NCE MEAN DIFFERENCE	T VALUE	T PROBABILITY	LEVEL OF SIGNIFICANCE
KINDERGARTEN, 1982 APS VS Non-APS	2.05	1.188	0.235	NS
APS vs. No-DC	10.86	6.616	0.000	.01
Non-APS vs No-DC	8.82	4.936	0.000	.01
GRADE 1, 1983 APS vs Non-APS	7.00	3.551	0.000	.01
APS vs No-DC	9.98	5.323	0.000	.01
Non-APS Vs No-Dc	2.98	1.465	0.143	NS
GRADE 2, 1984 APS vs Non-APS	-0.37	-0.249	0.803	NS
APS vs No-DC	2.35	1.721	0.086	NS
Non-APS vs No-DC	2.72	1.810	0.071	NS
GRADE 3, 1985 APS vs Non-APS	-0.20	-0.144	0.885	NS
APS vs No-DC	2.88	2.226	0.026	.05
Non-APS vs No-DC	3.08	2.147	0.032	.05

TABLE 8

MATHEMATICS ACHIEVEMENT BY DAY CARE EXPERIENCE FOR STUDENTS IN THE KINDERGARTEN CLASS OF 1983-84

22 SCHOOLS WITH DAY CARE PROGRAMS

DAY CARE EXPERIENCE	N	CALIFORNIA ACHIEVEMENT TESTS TOTAL MATHEMATICS MEAN NCE SCORE	
		KDG. 1984	GRADE 1 1985
Atlanta Public Schools (APS)	507	70.00	65.93
Non-Atlanta Public Schools (Non-APS)	409	70.47	66.04
No or Less than Six Months (No-DC)	555	62.33	62.02
Total	1,471	67.24	64.49

SUMMARY ANALYSIS OF VARIANCE, MATHEMATICS MEAN NCE SCORES, TABLE 8

GRADE AND YEAR	D. F.	F RATIO	F PROBABILITY	LEVEL OF SIGNIFICANCE
Kindergarten, 1984	(2) (1335)	5.5813	.0039	.01
Grade 1, 1985	(2) (1468)	19.1837	.0000	.01

MULTIPLE COMPARISONS OF GROUP MATHEMATICS MEAN NCE SCORES, TABLE 8

DAY CARE YEAR GROUP	NCE MEAN DIFFERENCE	T VALUE	T PROBABILITY	LEVEL OF SIGNIFICANCE
KINDERGARTEN, 1984 APS VS Non-APS	-0.48	-0.302	0.762	NS
APS vs. No-DC	7.67	5.271	0.000	.01
Non-APS vs No-DC	8.14	5.277	0.000	.01
GRADE 1, 1985 APS vs Non-APS	-0.11	-0.077	0.938	NS
APS vs No-DC	3.91	2.904	0.004	.01
Non-APS vs No-Dc	4.02	2.784	0.005	.01

TABLE 9

MATHEMATICS ACHIEVEMENT BY DAY CARE EXPERIENCE FOR STUDENTS IN THE KINDERGARTEN CLASS OF 1984-85

22 SCHOOLS WITH DAY CARE PROGRAMS

DAY CARE EXPERIENCE	N	CALIFORNIA ACHIEVEMENT TESTS TOTAL MATHEMATICS MEAN NCE SCORE
		KDG. 1985
Atlanta Public Schools (APS)	507	73.55
Non-Atlanta Public Schools (Non-APS)	386	69.91
No or Less than Six Months (No-DC)	702	66.72
Total	1,595	69.67

SUMMARY ANALYSIS OF VARIANCE, MATHEMATICS MEAN NCE SCORES, TABLE 9

GRADE AND YEAR	D. F.	F RATIO	F PROBABILITY	LEVEL OF SIGNIFICANCE
Kindergarten, 1985	(2) (1592)	12.6764	.0000	.01

MULTIPLE COMPARISONS OF GROUP MATHEMATICS MEAN NCE SCORES, TABLE 9

DAY CARE YEAR GROUP	NCE MEAN DIFFERENCE	T VALUE	T PROBABILITY	LEVEL OF SIGNIFICANCE
KINDERGARTEN, 1985 APS VS Non-APS	3.64	2.31	0.021	.05
APS vs. No-DC	6.83	5.03	0.000	.01
Non-APS vs No-DC	3.19	2.16	0.031	.05

APPENDIXES

STATEMENTS OF CAT CATEGORY OBJECTIVES
Reported on the INDIVIDUAL TEST RECORD

PREREADING (Level 10 Only)

Listening for Information

The student will understand school vocabulary and terms used by teachers.
The student will understand space, direction, and location concepts.
The student will understand relationships among facts and concepts.

Letter Forms

The student will match uppercase and lowercase letter forms

Letter Names

The student will select a letter named orally.

Letter Sounds

The student will match initial long vowel sounds with a corresponding letter.
The student will match initial short vowel sounds with a corresponding letter.
The student will match initial consonant sounds with a corresponding letter.

Visual Discrimination

The student will match abstract shapes with identical forms.
The student will match identical, three-letter manuscript words.
The student will match identical, five- and six-letter printed words.

Sound Matching

The student will recognize identical oral words
The student will recognize differences in medial short vowel sounds of oral words.
The student will recognize differences in initial consonant sounds of oral words.
The student will recognize differences in final consonant sounds of oral words.
The student will recognize differences in consonant cluster and consonant digraph sounds of oral words.

READING (Levels 11-19)

Phonic Analysis

The student will recognize sounds of single consonants. (Level 11)
The student will recognize sounds of consonant clusters. (Level 11)
The student will recognize sounds of consonant digraphs. (Level 11)
The student will recognize variant sounds of single consonants. (Levels 11-12)
The student will recognize sounds of consonant clusters and consonant digraphs. (Levels 12 & 13)
The student will recognize short vowel sounds. (Level 11)
The student will recognize long sounds of vowels and vowel combinations. (Levels 11 & 12)
The student will recognize short sounds of vowels and vowel combinations. (Level 12)
The student will recognize short and long sounds of vowels and vowel combinations. (Level 13)
The student will recognize diphthong sounds of vowel combinations. (Level 13)
The student will recognize variant sounds of vowels and vowel combinations. (Level 13)

READING (continued)

Structural Analysis

The student will recognize compound words, syllables, and contractions. (Levels 12 & 13)
The student will recognize base words and affixes. (Levels 12 & 13)

Reading Vocabulary

The student will select a word that belongs in a specified category. (Level 11)
The student will select a word that matches an oral definintion. (Level 11)
The student will identify words or phrases that have the same meaning. (Levels 11-19)
The student will identify words that have opposite meanings. (Levels 12-19)
The student will identify the correct definition of a multimeaning word that has been used in a sentence. (Levels 13-19)

Reading Comprehension

Literal

The student will understand the meaning of a sentence. (Level 11)
The student will recall facts. (Levels 11-19)

Interpretive

The student will infer meaning and analyze characters. (Level 11)
The student will infer meaning. (Levels 12-19)
The student will analyze characters. (Levels 12-19)
The student will interpret figurative language. (Levels 13-19)

Critical

The student will discriminate between real and unreal elements. (Level 13)
The student will analyze author attitude or position. (Levels 14-19)
The student will analyze persuasion techniques. (Levels 16-19)

Spelling

The student will recognize correct graphemic representation of consonant phonemes in words. (Levels 12-19)
The student will recognize correct graphemic representation of vowel phonemes in words. (Levels 12-19)
The student will recognize correct graphemic representation of morphemic units in words. (Levels 12-19)

Language Mechanics

Captalization

The student will recognize correct capitalization of the pronoun I and proper nouns. (Levels 12 & 13)
The student will recognize correct capitalization of the pronoun I, proper nouns, and proper adjectives. (Levels 14-16)
The student will recognize correct capitalization of beginning words. (Levels 12 & 13)
The student will recognize correct capitalization of beginning words and titles. (Levels 13-16)

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READING (continued)

Language Mechanics (continued)

Punctuation

The student will recognize the correct use of end marks. (Levels 12-16)
The student will recognize the correct use of end marks, the colon, and the semicolon. (Levels 17-19)
The student will recognize the correct use of the comma. (Levels 12-19)
The student will recognize the correct use of quotation marks. (Levels 14-16)

Language Expression

Usage

The student will select a singular or plural noun for a sentence. (Level 11)
The student will select the correct form of an irregular plural noun or an irregular verb for a sentence. (Level 12)
The student will select the correct pronoun for a sentence. (Levels 11-19)
The student will select the correct verb form for a sentence. (Levels 11-19)
The student will select the correct adjective for a sentence. (Levels 11-16)

Sentence Structure

The student will identify the subjects and verbs of sentences. (Levels 13-19)
The student will select the correct modifying word for a sentence. (Level 13)
The student will select the correct modifying words and transitional words or phrases for sentences. (Levels 14-19)
The student will identify complete, incomplete, and run-on sentences. (Levels 14-16)
The student will recognize verbosity and repetition in sentences. (Levels 17-19)
The student will recognize misplaced modifiers and nonparallel structure in sentences. (Levels 17-19)

Paragraph Organization

The student will select the correct sentence sequence for a paragraph. (Levels 14 & 15)
The student will select the correct sentence sequence for a paragraph and select a sentence that best develops a topic sentence. (Level 16)
The student will select the correct sentence sequence for a paragraph, select a sentence that best develops a topic sentence, and select the best concluding sentence for a paragraph. (Levels 17-19)

MATHEMATICS

Mathematics Computation

The student will solve computation problems in addition. (Levels 11-19)
The student will solve computation problems in subtraction. (Levels 11-19)
The student will solve computation problems in multiplication. (Levels 12-19)
The student will solve computation problems in division. (Levels 13-19)

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MATHEMATICS (continued)

Mathematics Concepts and Applications

The student will demonstrate an understanding of numeration. (Level 1[illegible]-19)
The student will demonstrate an understanding of number theory. (Levels 13-17 & 19)
The student will demonstrate an understanding of number theory and set theory. (Levels 10-12)
The student will demonstrate an understanding of number sentences. (Levels 10, 11 & 14-16)
The student will demonstrate an understanding of number theory and number sentences. (Level 18)
The student will demonstrate an understanding of number properties. (Levels 14-16)
The student will demonstrate an understanding of number sentences and number properties. (Levels 12, 13, 17 & 19)
The student will demonstrate an understanding of common scales. (Levels 13-15)
The student will demonstrate an understanding of geometry. (Levels 13, 14 & 17-19)
The student will demonstrate an understanding of measurement. (Levels 13, 14 & 17-19)
The student will demonstrate an understanding of geometry and measurement. (Level 16)
The student will demonstrate an understanding of graphs. (Levels 13, 14 & 16)
The student will demonstrate an understanding of measurement and graphs. (Level 12)
The student will demonstrate an understanding of geometry, measurement, and graphs. (Levels 11 & 15)
The student will demonstrate an understanding of functions and graphs. (Levels 17-19)
The student will solve story problems. (Levels 10 & 13-19)

REFERENCE SKILLS

Reference Skills

The student will obtain information from a title page and a copyright page of a book. (Level 14)
The student will obtain information from the table of contents of a book. (Level 14)
The student will obtain information from the index of a book. (Level 14)
The student will obtain information from a dictionary page. (Levels 14-19)
The student will obtain information from a map. (Levels 14-19)
The student will obtain information from a table. (Levels 15-19)
The student will obtain information from library catalog cards. (Levels 15-17)
The student will obtain information from a diagram. (Levels 16 & 17)
The student will recognize information required to complete a form. (Levels 18 & 19)
The student will obtain information from the Readers' Guide to Periodical Literature (Levels 18 & 19).

The information on this page is based on information found in the Class Management Guide to the California Achievement Tests C & D.

The California Achievement Tests
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Del Monte Research Park
Monterey, California 93940

READY STEPS LANGUAGE SURVEY

Hillerich, Robert L. and Johnson, Timothy G. (1986)
Ready Steps Language Survey. Boston: Houghton Mifflin Company.

TEST	SKILL AREAS
1. AUDITORY DISCRIMINATION	. . . hear the differences between beginning sounds (coat or goat?
2. FOLLOWING ORAL DIRECTIONS	. . . perform simple tasks involving one-, two-, and three-step directions?
3. INSTRUCTIONAL LANGUAGE	. . . Understand instructional words commonly used in kindergarten and first-grade reading programs (words such as on, under, above, in)?
4. GENERAL VOCABULARY	. . . Name common objects typically pictured in a pre-reading program?
5. ORAL LANGUAGE DEVELOPMENT	. . . express ideas in sentences that include more than a noun and a verb?
6. LISTENING COMPREHENSION	. . . listen to a selection and recall significant details?
7. SEQUENCING	. . . recognize sequence of events in a pictured story?
8. CATEGORIZING	. . . sort or classify things that are similar in some way?
9. USING ORAL CONTEXT	. . . supply a missing word when oral context is given?
10. LETTER FORM DISCRIMINATION	. . . notice minor differences between letter forms — both lower-case and capitals?

STUDENTS PERFORMANCE ON READY STEPS LANGUAGE SURVEY
BY DAY CARE EXPERIENCE
82 ELEMENTARY SCHOOLS IN SYSTEM

1986-87

Ready Steps Language Survey Skill	Percent of Student Performance											
	Atlanta Schools Day Care N=813			Non-Atlanta Schools Day Care N=2263			No or Less Than Six Mos. Day Care N=2419			Total Student Performance N=5495		
	M	NM	NT	M	NM	NT	M	NM	NT	M	NM	NT
Auditory Discrimination	91	8	1	92	7	1	80	19	1	87	12	1
Following Oral Directions	97	2	1	98	1	1	93	5	2	96	3	1
Instructional Language	70	28	2	73	26	1	53	45	2	64	35	1
General Vocabulary	90	3	7	93	3	4	82	8	10	88	5	7
Oral Language Development	62	31	7	68	28	4	52	37	11	60	33	7
Listening Comprehension	72	20	8	76	20	4	59	30	11	68	24	8
Sequencing	53	39	8	58	37	5	38	50	12	49	43	8
Categorizing	88	5	7	90	5	5	77	12	11	84	8	8
Using Oral Context	82	11	7	84	11	5	71	18	11	78	14	8
Letter Form Discrimination	90	2	8	93	2	5	85	4	11	89	3	8

M = Mastery of Skill
NM = Non-Mastery of Skill
NT = Not Tested on Skill

TEST FOR READY STEPS — PERCENT OF KINDERGARTEN STUDENTS MASTERING SKILLS BY DAY CARE EXPERIENCE
OCTOBER 1981

Test for Ready Steps Skills	Day Care Experience			
	APS Title XX Day Care N=838	Non-APS Day Care N=1,990	No Day Care (or Less Than 6 Months) N=1,816	System* Total N=4,733
1. Distinguishes differences in beginning sounds in whole words.	88	86	77	81
2. Demonstrates understanding of instructional language commonly used in kindergarten.	76	77	57	68
3. Follows one-, two-, and three-step oral directions.	90	85	80	82
4. Recalls significant details after listening to a story.	59	59	42	51
5. Recognizes and describes a sequence of events.	32	36	25	30
6. Orally dictates meaningful information to an adult.	78	78	68	73
7. Names common nouns when presented with pictorial stimuli.	84	80	64	73
8. Categorizes groups of common items by generalizing as to how these items are related to each other.	64	60	45	53
9. Uses oral context to suggest a word which makes sense in completing a sentence.	76	75	62	69
10. Discriminates similarities and differences in both upper- and lower-case letter forms through matching.	92	89	82	85

*The Test for Ready Steps was administered to 4,733 kindergarten students in October 1981. Day care experience for 4,662 children was specified on the Pupil Project File.

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THE KINDERGARTEN CLASS OF 1980-81. STUDENTS IN THE COMPENSATORY EDUCATION PROGRAM FROM 1980-81 TO 1986-87

DAY CARE EXPERIENCE	COMPENSATORY EDUCATION STUDENTS		NON-COMPENSATORY EDUCATION STUDENTS		TOTAL GROUP	
	N	%	N	%	N	%
ATLANTA PUBLIC SCHOOLS DAY CARE	310	53	274	47	584	20
NON-ATLANTA PUBLIC SCHOOLS DAY CARE	556	42	760	58	1,316	39
NO OR LESS THAN SIX MONTHS OF DAY CARE	743	57	568	43	1,311	41
TOTAL	1,609	50	1,602	50	3,211	100

THE 1980-81 KINDERGARTEN CLASS

GRADE AT FIRST-TIME PLACEMENT AND NUMBER OF YEARS IN THE COMPENSATORY EDUCATION PROGRAM, 1980-81 TO 1986-87

DAY CARE EXPERIENCE	N	PERCENT OF STUDENTS								
		FIRST-TIME GRADE						NO. OF YEARS		
		1	2	3	4	5	6	ONE YEAR	TWO YEARS	MORE THAN TWO YEARS
ATLANTA PUBLIC SCHOOLS DAY CARE	310	21	30	16	11	03	19	48	34	18
NON-ATLANTA PUBLIC SCHOOLS DAY CARE	556	22	22	24	15	04	12	47	32	21
NO OR LESS THAN SIX MONTHS OF DAY CARE	743	30	24	18	13	04	11	44	33	23
TOTAL	1,609									

THE 1980-81 KINDERGARTEN CLASS
STUDENT TRANSFERS TO DIFFERENT SCHOOLS FROM 1980-81 TO 1986-87

DAY CARE EXPERIENCE	N	PERCENT OF STUDENTS ATTENDING NUMBER OF DIFFERENT SCHOOLS				
		1	2	3	4	5
ATLANTA PUBLIC SCHOOLS DAY CARE	535	32	40	21	06	01
NON-ATLANTA PUBLIC SCHOOLS DAY CARE	1,074	34	43	16	06	01
NO OR LESS THAN SIX MONTHS DAY CARE	1,126	36	37	20	05	02
TOTAL	2,735					

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